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WHAT SHOULD BE DONE WITH ACUTE CHOLECYSTITIS?*

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THE thesis for our discussion poses a question of, "What should be done for patients with acute cholecystitis?" This problem has given rise to so many heated discussions and such widely differing conclusions have been reached, that perhaps it would be well to try to define what we mean by the term "acute cholecystitis" before we attempt to answer the question.

Definition

It is necessary to realize that the term "acute cholecystitis" is a label applied to a disease process which varies with each patient and constantly changes in the same individual. The pathologic changes and the associated physiologic dysfunctions are invariably kinetic and never static. Such an approach to our problem carries the implication that few invariant rules can be laid down for the proper course to be followed in the treatment of each individual disease process. The time is probably very remote when fixed rules of procedure will supplant the surgical judgment of the experienced clinical surgeon.

Purpose of Reviewing 500 Cases.—It would seem that an analytical review of a large number of cases of this disease should yield some useful suggestions in determining the proper management of individual cases. Therefore, my coworkers and I have made a study of 500 cases of "acute cholecystitis" admitted to the Cook County Hospital in 1939, 1940 and the first four months of 1941. In the selection of these cases we used not only those which were admitted in an acute attack, but also included fifty-five patients who gave a history of having had previous acute attacks, although on admission the condition was not acutely active. If we agree that gallbladder disease is a changing dynamic process, either growing progressively worse or temporarily receding, we should have as much concern with those patients who have experienced and recovered from previous acute attacks as we have with those admitted to the hospital while suffering from such an episode.

As we have considered it, then, acute cholecystitis is a descriptive term given to varying degrees of acute inflammation of the gall bladder. The inflammatory changes found in our patients revealed many histological alterations which were obviously recent. Yet almost uniformly these were superimposed on chronic changes in the gall bladder, its closely related biliary tract, and the liver.

Pathogenesis

Attention has been called repeatedly to the paradoxical fact that so few pathogenic bacteria are found in the walls or contents of acutely inflamed gall bladders. The frequency of sterile inflammation and the degree to which it may progress without becoming secondarily infected are moot questions. Nevertheless, this chemical inflammation can be almost as devastating as a bacterially initiated one.

On examination of the surgical and pathologic reports in our series we found that slightly more than 80 per cent of the patients operated upon exhibited gallstones. A somewhat higher incidence is reported in most statistical studies. Foss and Lillie[6] and Berk[1] report 92 per cent; Walters[11] gives a figure of 89 per cent. In 8 per

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TABLE I. CORRELATION BETWEEN PATHOLOGIC CONDITION FOUND AT OPERATION AND TEMPERATURE, PULSE RATE AND WBC.

Operative pathologic condition	Temperature above 100	Pulse rate above 100	WBC above 10,000
Perforation	76%	50. %	86. %
Gangrene	57%	33. %	85.7%
Empyema	66%	23. %	73.3%
Acute suppurative	50%	42.8%	57. %
Acute	50%	34.7%	61. %

cent of the operative cases in our series there was no report as to whether or not stones were present in the gall bladder.

In those cases with calculi one is impressed with the frequent occurrence of a mechanical obstruction due to the impaction of a stone in the neck of the gall bladder or in the cystic duct. Here we find a mechanism which quite regularly initiates a chain of destructive processes. In any hollow viscus, obstruction plus secretion leads to a luminal distention, which continues until the secretory pressure of the lining cells is reached or exceeded. When this level is attained, it is at or near the level of the arteriolar and capillary pressure of the vessels which maintain the vitality of the walls of the obstructed viscus. In some instances areas of focal necrosis develop, and these may extend and coalesce until the walls are widely devitalized. Even before frank rupture occurs, these walls become as permeable as an inert membrane, so that chemicals, toxins and even bacteria may filter through them in either direction. In some instances this permeability of the devitalized gall-bladder wall permits bile to filter out into the free peritoneal cavity, where it may set up a local or diffuse peritonitis. In our study there were fourteen cases in which free fluid was found in the peritoneal cavity, although there was no evidence of perforation of the gall bladder.

Symptoms

In the recent literature on acute cholecystitis we find some authors stating what combination of symptoms and laboratory findings can be relied upon as an indication of the necessity for surgical intervention. A leukocytosis, a rising temperature and an increasing pulse rate have been particularly emphasized.[5] On the other hand, many investigators state that the clinical picture is a very inadequate guide to the pathologic changes which may be found at operation.[1,2,7]

We have found that the onset of the attack is not usually accompanied by an appreciable rise in temperature or a marked leukocytosis, so that the condition may become very serious before these objective symptoms appear. This situation may be summarized as follows:

	Percentage of total (500)	Percentage showing symptoms within 24 hours
WBC above 10,000	49.2 (246)	17. (41)
Temperature above 100	23. (116)	21. (24)
Pulse above 100	20. (100)	22. (22)

The correlation which we found to exist between the pathologic condition seen at operation and the temperature, pulse rate and white cell count is shown in Table I.

In the case of perforation, gangrene, and empyema we found the correlation with the temperature and leukocyte count to be fairly constant; but from the figures we obtained it would not appear that these signs can be too implicitly relied upon.

Pain at some time during an attack seemed to be an almost universal symptom; 99.6 per cent of the patients we studied had severe pain with their attacks. Forty per cent of these had a colicky type of pain. Only one patient, who incidentally was found at operation to have an empyema of the gall bladder, gave a history of no pain. One other patient was moribund when admitted and no history was obtained before he expired. At autopsy he was found to have a perforated gall bladder with a diffuse peritonitis. Tenderness in the right upper quadrant was almost as invariable a symptom as pain; 95.2 per cent presented this condition. Ninety-one and eight-tenths per cent of the 500 patients had nausea, and 86 per cent vomited with their attacks. Thirty-eight and four-tenths per cent of the patients in our series were either jaundiced on admission or gave a history of having previously been jaundiced. Eighty-three per cent of the patients operated upon and who were jaundiced had stones. All of the patients who exhibited calculi in the common duct were jaundiced on admission. In 38.8 per cent of the cases a

rigidity of the upper abdomen, ranging from slight to severe, was found, and in 29.6 per cent a mass was palpable in the region of the gall bladder. The correlation between these two physical findings and the pathologic condition revealed at operation is shown in Table II.

When a patient presents a combined picture of rising temperature, an increasing leukocytosis, marked muscular rigidity and tenderness, an extremely grave situation, of course, is suspected.

TABLE II. CORRELATION BETWEEN PATHOLOGIC CONDITION AT OPERATION AND THE PRESENCE OF RIGIDITY AND MASS IN THE RIGHT UPPER QUADRANT OF THE ABDOMEN

Operative pathologic condition	Rigidity	Mass
Empyema	30. %	65. %
Perforation and gangrene	51.8%	37. %
Acute and subacute	61.2%	58. %
Acute suppurative	30. %	30. %
Hydrops	33. %	83.3%
Common duct stone	25. %	18.7%
Phlegmon	0	50. %
Chronic	30. %	25. %

Dangers of Perforation

It has too often been assumed that perforation of the gall bladder is so rare an occurrence as to be a negligible consideration. However, recent statistical studies have shown that the possibility of a rupture of the gall bladder is not to be dismissed lightly. Edwards, et al.,[3] who recently reviewed 194 cases of acute cholecystitis proven either by operation or autopsy, showed that perforation of the gall bladder into the peritoneal cavity occurred in twenty-one patients, a percentage of 10.82, with a mortality of 28.59 per cent in those who perforated. Eiss[4] gives figures on 574 cases, in 9.2 per cent of which perforation occurred, with a 35 per cent mortality in the patients who perforated. Heuer[7] has combined figures from 35,000 cases in which there was a 20 per cent incidence of perforation with a 10 per cent mortality. In our series, fourteen of the 216 operated cases (6.9 per cent) were found to have an acute perforation of the gall bladder, and six of these died (42.8 per cent). Two patients who died without operation were also found at autopsy to have a perforation. Thus, in a total of sixteen acute perforations there was a 50 per cent mortality.

Such a dangerous possibility must always be kept in mind when considering the management of an acute cholecystitis. The problem in cases where impending or actual perforation is suspected is that of deciding on the extent of immediate operative interference and of giving the patient careful pre-operative and postoperative care. With this statement very few could take exception.

In view of such dangers, it might be asked, when are we, if ever, justified in delaying operation in acute gall-bladder attacks?

When to Operate?

Radical versus Conservative Treatment.—Surgical opinion on the management of acute cholecystitis today seems to be divided into two schools of thought. The so-called radical group plead for early operation in every case. Many of them suggest that acute cholecystitis is analogous to acute appendicitis. On the other hand there are many distinguished surgeons who are inclined to a more conservative view, and suggest that watchful expectancy in some cases of acute inflammation of the gall bladder is not only advisable, but is followed by better results than would occur if the rule of early operation in all cases were invoked. These advocates of conservative management point out glaring contradictions in the assumption that acute gall-bladder disease is analogous to an acute inflammation of the appendix. The arguments pro and con cannot be given in this paper. Approaching our problem with the recognition of the dynamic process character of the disease, we find that the solution is difficult because of our inability to correctly predict the outcome of a condition affording us such meager dependable data for conclusions.

It has been generally agreed that the safest time for emergency operation is within the first twelve to twenty-four hours of the attack. In order to accomplish this, a surgeon would need to serve only the most highly intelligent and thoroughly coöperative patients. The situation that actually exists in most surgical practices and services is not conducive to surgical intervention in the first few hours of acute attacks. In the majority of patients, biliary colics or postprandial distresses of varying degrees of severity are

common episodes. Seventy-five per cent of those in our study had had previous attacks for an average period of three years. Such patients had been experiencing attacks ranging from slight postprandial discomfort to severe, disabling seizures. If the patient or the attending physician could only know when the first symptoms were going to culminate in a violent attack with serious involvement of the biliary tract, such clairvoyance would undoubtedly lead the patient to submit himself to the earliest possible surgical intervention. If he has weathered one or more such episodes before, however, he will be inclined to hope to do so again. Therefore, it is usually only after the patient is thoroughly convinced that the attack is not going to recede that he seeks advice. The delay may allow the disease process to advance to a critical stage before the surgeon is consulted.

In our series 23 per cent came to the hospital within the first twenty-four hours of the onset of acute symptoms, and this figure probably is somewhat higher than would be found in a noncharity hospital.

There may be instances of acute inflammation of the gall bladder occurring in very young persons in whom neither history nor associated findings suggest a previous disease of the biliary tract, but this may be regarded as the exception rather than the rule. In our study there were only 70 patients under thirty years of age. Of this group, only fifteen were admitted when having their first attack of gall-bladder disease. The remainder had been having attacks for an average of 1.3 years.

Such a situation as we have just discussed, in itself offers almost insuperable obstacles to the laying down of any rigid rules of conduct for either patient or surgeon.

It is undoubtedly true that the acute attack does subside in many instances. Of the 500 cases reviewed, 216 (43.1 per cent) received operation, and 284 (56.9 per cent) were treated medically. Of these 284, 6.3 per cent refused operation, although it was recommended; and six others (2.1 per cent) went home on release, though unimproved. In other words, in about one-half of these cases the process did subside temporarily under a medical regime. In such instances, however, the symptoms and signs usually abated within a short time after the onset. In the cases we studied the average hospital stay of the nonoperative patients was nine days, while there was an average delay of twenty days before operation in the 216 operative cases.

It can scarcely be doubted that the most desirable time for gall-bladder surgery would be at a period when all acute symptoms have subsided. Among the fifty-five patients (25.4 per cent) in this study who had such "elective" operations, there were no deaths. The difficulties of the operation are greatly reduced. Cholecystectomy can be done more regularly, and the operation of cholecystostomy (which must so frequently be followed later by a cholecystectomy) does not have to be resorted to. Our records show that those patients who are "cooling off" have an almost fifty-fifty chance of reaching a satisfactory quiescent state. This would offer some encouragement to those who recommend the conservative treatment in many acute gall-bladder conditions.

The problem that every surgeon faces, however, when confronted by an acute upper abdominal pain in a case where the gall-bladder is under suspicion, is the decision as to whether this is a time when the disease will subside with medical treatment, or whether surgical intervention is imperative.

While we cannot presume to give a sharp answer to this problem, certain important factors emerge from our review which may be of some assistance in determining the wisest course to follow.

Duration of Illness.—The duration of the patient's illness must, of course, be taken into consideration.

Many investigators have attempted to determine the optimum time for operation after the onset of an acute attack. Table III sums up the relationship in our series between the mortality rate and the delay from onset of recent acute symptoms to operation.

In a large series of operative cases (3,986), Heyd[8] has given figures to show that the safest time for emergency operation is within six to twenty-four hours after onset of the acute attack. In the group we have studied only three were operated upon within twenty-four hours of the onset of symptoms and none of them died. There was only one death among those operated upon within three days of the beginning of the attack. After three days the mortality rate rises rather sharply.

TABLE III. RELATIONSHIP BETWEEN MORTALITY RATE AND DELAY FROM ONSET OF ATTACK TO SURGERY.*

Delay from onset of attack to surgery	No.	Per cent	Deaths	
			No.	Per cent
Less than 1 day	3	1.8	0	0
1 to 3 days	18	11.2	1	5.5
4 to 7 days	20	12.5	4	20.
8 to 14 days	28	17.5	5	17.8
15 to 21 days	28	17.5	3	10.7
22 to 30 days	28	17.5	8	28.5
1 to 2 months	31	19.3	5	16.1
Over 2 months	4	2.5	2	50.

*Of the 216 operated patients, 161 were admitted in acute attack. In one instance of these 161 cases the time of onset was not given. Fifty-five were not in acute attack on admission, but had had one or more previously. In this group there were no deaths.

In the group of operative patients who died there was an average delay of twenty-four days from the onset of symptoms until surgery. In the operative patients who survived (excluding the 55 elective operations), there was an average delay of eleven and one-half days from the onset of symptoms to operation. This is not very conclusive, however, because the longer delay was given in the hope that the patient would be better able to withstand an operation. The shorter delay speaks for more tractable cases.

Importance of Age of Patient.—A factor which must be considered in combination with the duration of the patient's illness is his age. Some reports have stressed the severity of gall-bladder disease in younger patients, but our figures show a higher mortality rate among older individuals, which rises proportionately with age. Table IV gives the relationship between the age groups and the mortality rate.

Chronic disease processes in the liver, kidneys and lungs are less likely to be present in the young patient. The duration of symptoms referable to the gall bladder in the younger group of patients in our series was 1.3 years, while in the older group the average duration of symptoms was 3.8 years. In the younger individual there is usually a greater assurance of a sufficient liver function reserve to carry him through an acute gall-bladder attack and the emergency operation.

TABLE IV. RELATIONSHIP BETWEEN AGE OF PATIENT AND MORTALITY RATE, TOTAL GROUP AND OPERATED PATIENTS.

Age of patient	Total group (500)			Operative group (216)		
	No.	%	Mortality %	No.	%	Mortality %
Under 30	70	14.	1.42	23	10.7	4.3
30 to 50	266	53.2	6.7	118	54.6	11.01
Over 50	165	32.8	12.1	75	34.7	18.6

The occurrence of an acute attack in the person of middle age and above, however, does not offer as definite an indication for emergency surgery. The patients in these age groups are prone to have chronic degenerative diseases of the liver, pancreas, kidneys, heart and lungs, and the pathologic process in the gall bladder is more likely to have concomitant disease processes in the liver and the biliary tract. In thirty operative cases there was definite mention of a diseased liver and in thirteen instances a diseased pancreas was noted; twelve of these forty-three individuals died (27.9 per cent). The average age of these patients was fifty years and they had been having previous attacks for an average of three and one-half years. Just as treacherous is the presence of stones in the common bile duct. In our study such a condition was found in sixteen operative patients and seven of these died (43.7 per cent). All of them had been having gall-bladder attacks for two or more years. The average age of these patients was forty-five years.

In such cases, before indulging in hasty surgical intervention, a very careful evaluation of the risk must be made, followed by a thorough preoperative preparation. If the patient is having an acute attack, one cannot and should not indulge in a series of tests and studies that have not been shown to be fairly dependable, nor should operation be delayed longer than needed for adequate preparation.

Regimen for Management

It would be well for every surgeon and every hospital to outline a thoroughly thought out regime for the management of acute cholecystitis cases. Adherence to such a regime should make for more efficient and accurate evaluation of each individual case and unnecessary delay may

be eliminated in those cases where emergency operation is felt to be imperative. Adequate preoperative and postoperative care can do much both to reduce the mortality rate and the incidence of debilitating complications.

In my own service we are inclined to proceed along fairly standard lines. As soon as the patient is admitted, we carry out the usual blood and urine examinations. If the patient is vomiting, we immediately pass a Levine tube and begin continuous suction. Glucose is administered intravenously in 5 per cent solution in water at

TABLE V. TYPES OF OPERATIONS EMPLOYED IN RELATION TO DELAY BETWEEN ADMISSION AND OPERATION AND IN RELATION TO MORTALITY

Immediate operation*			Delayed operation**			Totals	
	No.	%		No.	%	No.	%
Total patients this group	25	11.5	Total patients this group	191	87.9	216	100
Cholecystostomy	22	88.	Cholecystostomy	29	15.1	51	23.6
Deaths	4	18.1	Deaths	8	27.5	12	23.5
Cholecystectomy	1	4.	Cholecystectomy†‡	137	71.7	138	63.8
No deaths			Deaths	7	5.1	7	5.07
Exploration only	2	8.	Cholecystectomy and exploration or drainage common duct	22	11.5	22	10.
Deaths	1	50.	Deaths	7	31.8	7	31.8
			Explore only	2	1.04	4	1.8
			Deaths	1	50.	2	50.
			Drained abscess only	1	.52	1	.45
			No deaths				
Total mortality this group	5	20.	Total mortality this group	23	12.		

* Twenty-four hours or less from admission to surgery.
**Average delay (191 cases) of twenty days.
†Includes two partial cholecystectomies.
‡Includes forty-three cases in which appendectomy was also done. No deaths in this group.

TABLE VI. RELATIONSHIP BETWEEN OPERATIVE PATHOLOGIC CONDITIONS AND DURATION OF ILLNESS

Delay from onset of attack to surgery	Pericholecystic abscess	Conditions found at operation: Common duct stone	Perforation and gangrene	Acute and subacute cholecystitis	Acute suppurative cholecystitis	Phlegmon	Empyema
Less than 1 day			3		2		
1 to 5 days	2		9	5	2		5
5 days to 1 week			3		2		7
1 week to 3 weeks	1	2	6	19	3	1	7
Over 3 weeks	4	14	6	7	1	1	1
Totals	7*	16	27†	31	10	2	20
Mortality percentage	57.1	43.7	25.9	6.4	20.	100	30.

*Includes three cases of perforation with pericholecystic abscess formation; all three died.
†Includes four cases of chronic perforation.

the rate of about 500 c.c. per hour. Advantage is taken of this administration of glucose solution to make some estimate of the liver's functional capacity by testing the urine for sugar spill after each 500 c.c. flask. If the patient is a questionable risk, blood transfusion may be used. In every acute case donors are typed and matched. Intravenous administration of Vitamin C in the glucose or in salt solution is a routine procedure. The jaundiced patient presents a problem requiring special care. In the cases we studied, 56 per cent of those who died were jaundiced on admission to the hospital. I have elsewhere discussed the preparation of the jaundiced patient for surgery.[9]

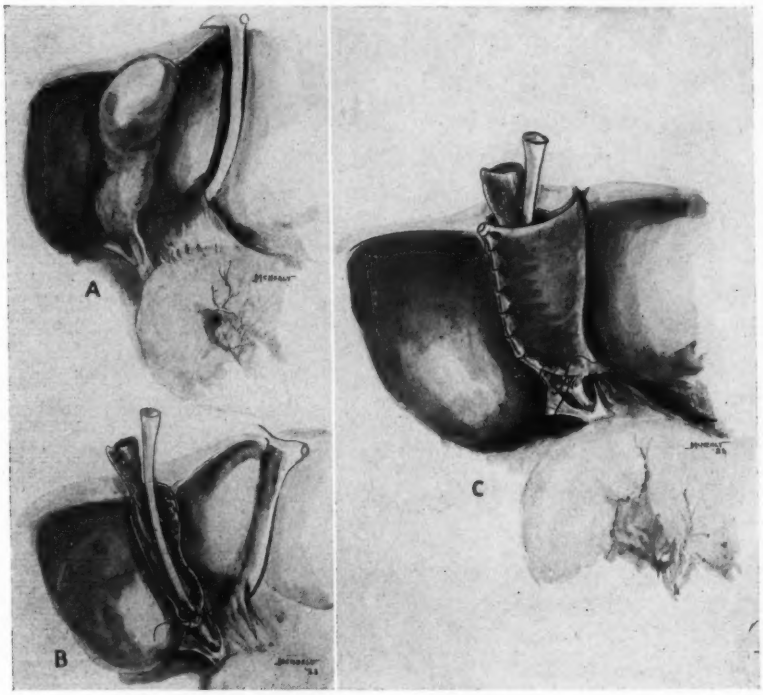

Fig. 1. Illustrating a technique for a partial cholecystectomy. *a.* Shrunken deformed gall bladder. *b.* The portion of the gall bladder which is firmly attached to the liver is not disturbed. The walls are trimmed off down to the cystic duct, into which a catheter is inserted down through to the common bile duct. A small iodoform gauze wick is brought out with the catheter. *c.* Showing falciform ligament attached to the lateral margin of gall-bladder edge. The wick and catheter are best delivered through a stab wound in the right subcostal area.

Operative Procedures

It is interesting to note that in the twenty-five operations done within twenty-four hours after admission to the hospital a cholecystostomy was employed in 88 per cent (22) of the cases. In the 191 operations which were delayed (for an average of twenty days), a cholecystectomy was employed in 83.2 per cent of the cases. Table V shows the types of operation employed in relation to delay between admission and operation and in relation to the mortality rate. The results in this table should be compared with those given in Table III where the relationship between mortality and the delay from the onset of the attack to operation is shown. No conclusions can be drawn as to the relative merits of cholecystostomy and cholecystectomy, because the former was almost always used in very serious cases. For example, cholecystostomy was done in twenty cases of perforation and gangrene, in ten cases of acute suppurative cholecystitis and in seventeen cases of empyema.

Partial cholecystectomies were used in only two instances in this series, but I have found

TABLE VII. RELATIONSHIP BETWEEN PATHOLOGIC REPORTS AND MORTALITY

Pathologic report	No.	Per cent	No. died
Chronic cholecystitis	16	11.	2
Chronic cholecystitis and cholelithiasis	97	66.8	5
Acute cholecystitis	7	4.8	1
Cholesteatosis	9	6.2	0
Chronic ulcerative cholecystitis	10	6.8	2
Hemorrhagic cholecystitis	6	4.1	1

TABLE VIII. PATHOLOGIC CONDITION OF OPERATIVE AND NON-OPERATIVE DEATHS

Operative		Non-operative	
Common duct stone	7	Perforation	2
Perforation	6	Empyema	1
Empyema	5	Diabetes	2
Acute suppurative	2	Hypertension and heart disease	2
Acute inflammation	2	Not known (no autopsy)	2
Phlegmon	2		
Hemorrhage*	2		
Gangrene	1		
Chronic†	1		

*Due to accidents in cases of anomalous vessels.
†Eviscerated postoperatively.

them of great value, especially where the gall bladder is very friable or necrotic in areas. This type of operation was recently described by Ritchie of Saint Paul.[10] I have practiced the method for nearly twenty years and can recommend it in selected cases (Figure 1, *a*, *b*, *c*).

In the elderly patient who presents a grave risk, we are inclined to use scopolamin and morphine as a preliminary narcosis and direct infiltration local anesthesia. A very easy and adequate exposure can be had in these cases through a subcostal incision about one inch below and parallel with the rib margin. This affords easy access to the fundus of the gall bladder for drainage, but should not be used, unless somewhat extended, for cholecystectomy.

In the postoperative care of these patients the value of glucose, sedation, oxygen and transfusion should be emphasized.

TABLE IX. RELATIONSHIP BETWEEN OPERATIVE COMPLICATIONS AND MORTALITY*

Complication	No.	Per cent	No. died	Per cent died
Pneumonia	18	8.3	12	66.6
Other pulmonary conditions	8	3.7	3	37.5
Peritonitis	12	5.5	9	75.
Wound infection	25	11.5	4	16.
Evisceration	3	1.3	2	66.6
Abdominal wall abscess	2	.92	0	0
Cholangitis and jaundice	7	3.2	4	51.1
Biliary fistula	6	2.7	0	0
Fecal fistula	2	.92	1	50.
Subphrenic abscess	7	3.2	2	28.
Hemorrhage and shock	2	.92	2	100.
Ileus	1	.45	1	100.
Toxic hepatitis and liver shock	3	1.3	2	66.6
Parotitis	3	1.3	0	0
Miscellaneous	6	2.7	3	50

*Many patients had multiple complications.

Pathology

Pathologic Condition at Operation.—The more serious conditions found at operation are given in Table VI, correlated with the duration of illness.

It is interesting to note in this table that perforation and gangrene were found in 44.4 per cent of those patients operated within five days of onset of symptoms.

Pathologic Reports.—There was little correspondence between the condition found at operation and the report of the tissue examined by the pathologist. Such reports were available in only 145 of the 216 operative cases. This is partly accounted for by the fact that there was an unusually high percentage of cholecystostomies in this series. Table VII presents the figures on such reports correlated with the number of deaths in each category.

Mortality

There was a mortality rate in these 500 cases of 7.8 per cent (thirty-nine deaths). Twenty-

eight of the 216 operated patients died, an operative mortality of 12.9 per cent. The pathologic condition in the operative deaths and the conditions found at autopsy or believed to be the contributing factors in the non-operative deaths are given in Table VIII.

Complications

Table IX presents the incidence of operative complications and the mortality entailed with each.

Summary

The term "acute cholecystitis" is a rather indefinite clinical expression which has been used with a wide variation of implications by authors on this subject. The dynamic process character of the disease makes it impossible to lay down precise rules for "when to operate." In considering this problem, the duration of the illness and the age of the patient must especially be taken into account. If operation can be done within twenty-four hours of onset of the attack, or if it can be safely delayed until the acute attack has subsided, these would seem to be the optimum times for surgery. However, since the majority of patients have previously weathered acute attacks, and consequently expect to continue to do so, they rarely present themselves for treatment in the first hours after onset of symptoms. Therefore, it is seldom possible to operate very early in the attack. There are also many cases where it would seem to be extremely hazardous to wait for the acute process to subside. In patients past middle life greater care must be exercised in evaluating the surgical risk and in giving them the advantage of adequate preoperative and postoperative management. A partial cholecystectomy is a valuable procedure in certain cases where the gall bladder is friable and extremely difficult to dissect from the liver bed. Cholecystostomy may be the operation of choice, especially in those older patients who present poor risks. The adoption of a rather standard regimen by hospitals and surgeons for the management of acute cholecystitis may reduce the incidence of complications and improve the mortality rate.

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REPORT OF THE STATE CHAIRMAN COMMITTEE ON MEDICAL PREPAREDNESS OF THE AMERICAN MEDICAL ASSOCIATION*

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THE Committee on Medical Preparedness was created by the Board of Trustees by authorization of the House of Delegates at the 1940 session of the American Medical Association in New York City. The committee comprises ten members of the House of Delegates and, ex officio, the president and secretary of the Association, the chairman and secretary of the Board of Trustees and the editor of the Journal. The committee is to coöperate with the advisory Commission on National Defense, the Army and Navy Medical Corps, the United States Public Health Service and all other Federal agencies in preparing our nation to meet any medical emergency.

Each state was provided with a chairman whose functions were (1) to coördinate the activities of state, county and district medical societies; (2) to coöperate with county medical societies in securing completion and return of the questionnaires on personal information; (3) to establish mechanisms for securing supplemen-

*Read before the annual meeting of the Minnesota State Medical Association, St. Paul, Minnesota, May 28, 1941.

tary information to the questionnaire if necessary; (4) to organize a state committee on medical preparedness, to be composed of the president and secretary of the state medical association, the state chairman of the Committee on Medical Preparedness and, ex officio, the members of the Committee on Medical Preparedness of the American Medical Association from the Corps Area in which the state is located and any others the group may select; (5) to assist in the organization of county committees on medical preparedness; (6) to invite local and state health authorities to participate in the work of the program, particularly in the matter of civilian health; (7) to arrange for the dissemination of information on medical preparedness to the groups concerned with any particular matter; (8) to assist in the verification of the qualifications of physicians desired for service in the army, in industry or in special physical examinations and other special work necessary for national defense and (9) to report to the Committee on Medical Preparedness of the American Medical Association the names of physicians from each county of the state whose services are believed to be necessary for the maintenance of civilian health and who should, in the opinion of the state committee, be exempt from military service.

Of the schedules sent to the 3,517 licensed physicians in Minnesota, 97 per cent were returned. Letters to the remaining 3 per cent requesting the filling out and mailing of the schedules have been sent this week. Of the licensed physicians, 2,600 are members of the state medical association.

For the most part, the work in Minnesota has been handled through the office of the secretary of the State Association. The councilors and county officers have been most coöperative in furthering completion of the canvass.

The selective service regulations called for physicians in the specialties of surgery, medicine, orthopedics, ophthalmology, otolaryngology, pathology and neuropsychiatry to serve at the induction center at Fort Snelling in order to perform final examinations of inductees for one year's training in the army. The pool was formed by solicitation and voluntary acceptance of physicians from Minneapolis, St. Paul, Rochester, Willmar, St. Peter, Cambridge and Moose Lake to serve when called by the medical officer at the induction center. Remuneration was at the rate of fifteen dollars per day. Up to May 28, 12,000 inductees had been examined; 11.6 per cent of these were rejected.

Another important function of the state committee is to create a pool of physicians for replacements in communities left without physicians by reason of entering army service.

The council passed a resolution which authorized county chairmen to take census of requirements in their respective communities. Recent communications from the secretary of the American Medical Association urges that the names, or at least the number, of physicians above and below the age of fifty-five years be tabulated so as to provide a working basis for evaluating the needs throughout the nation.

Communities without physicians will have to be supplied from near by centers by local physicians and an adjustment of fees that will be equitable to the physician for services rendered is a problem which to the patient in compensating for the service will require the attention of the county societies.

According to Mr. Davenport, in the issue of *Collier's* for May 10, 1941, the Selective Service system, under the direction of Mr. Clarence A. Dykstra and Brigadier General Lewis B. Hershey, has inducted 150,000 selectees per month into the army.

Although there was a variance of opinion among the neuropsychiatrists who examined these men, they were all of one accord that instead of 2 per cent of the inductees being rejected for mental disorders, the true percentage would be nearer 15 per cent. During the training period of the American Expeditionary Force in 1917-1918, 50 per cent of all casualties for which men were discharged were neuropsychiatric. At that time, no sincere effort was made to keep the mentally unfit out of the army. About 70,000 men, however, were rejected soon after reaching camp. In July, 1918, General Pershing cabled the Chief of General Staff in Washington the importance of eliminating the mentally unfit from replacement troops.

The selective service neuropsychiatric group under the able leadership of Dr. Sullivan has calculated, from correlated study and experience, that of the casualties, exclusive of fatalities occurring in the first eighteen months of service, 40 per cent will be neuropsychiatric cases. At

present, 14,232 more beds are being provided by the Veterans Administration; 5,268 of these will be for neuropsychiatric patients. It is estimated that for every neuropsychiatric patient, the Government pays $30,000.

Owing to the lack of qualified psychiatrists, and in the effort to eliminate the mentally deficient, it will be necessary to regulate the induction to make it possible for the induction teams to work harmoniously and avoid bottle necks. The army induction work sheet, especially the neuropsychiatric portion, has proved inadequate for the purpose for which it was intended.

It was with this in view that a work sheet was requested by the first of the year before inductions became heavy. Dr. J. A. Aita, Fellow in Neurology in the Mayo Foundation who had served on the Induction Board, consented to build up a neuropsychiatric work sheet which would cover the salient minimal data which could be carried out on an average of six minutes per inductee. At the induction center at Fort Snelling, we were fortunate in having neuropsychiatrists of Minneapolis, St. Paul and those from state institutions and the Mayo Foundation in attendance. In a recent study of 2,612 inductees, forty-nine, or about 2 per cent, were disqualified because of neuropsychiatric disorders.

The value of these examinations cannot be estimated accurately, but an approximation can be determined to justify the procedure. When a few weeks to a few years will have lapsed, figures will be available to make definite classifications for guidance in future mobilization.

Hypertension among the inductees has been in considerable evidence. The ordinary methods prescribed in regulations are not wholly adequate, in that borderline cases, which may be considered functional, are beginning types of true essential hypertension. In such cases, more detailed study by use of the cold pressor test and ophthalmic examination of the fundi as aids to the evaluation of the patient should be carried out. The standard blood pressure readings of 150 mm. of mercury systolic and 90 diastolic as set by the selective service regulation may exclude certain men who normally have a higher range of blood pressure. On the other hand, patients whose blood pressure during rest is within the normal range but who are really in the hypertensive group will be accepted. The more detailed examination, just mentioned, which is not time consuming, would prove worth while if the government costs in after years are considered.

Recent rulings by the Selective Service Board concerning deferments of medical students until after completion of internships are welcome. Much credit is due to the Deans of the Medical Schools for emphasizing the necessity of such a ruling, as otherwise depletion of the annual supply of physicians to the army certainly would occur.

THE DOCTOR IN THE NEW ARMY*

COLONEL JOHN R. HALL, M.D., Medical Corps, U. S. Army
Director of the Hospital Subdivision of the Office of The Surgeon General
Washington, D. C.

I BRING you greetings from The Surgeon General of the Army. It is a pleasure for me to be called to this rostrum as a representative of my chief. It so happens that I am a native of a neighboring state. It has been my good fortune to spend many periods of summer training with the medical R.O.T.C. groups at nearby Fort Snelling. I feel that I am almost a native son.

I have spoken of "my chief," The Surgeon General of the Army of the United States. I should like each one of you to ask himself the question, "Who, or rather what, is The Surgeon General of the Army?" I should like you to think of The Surgeon General as the doctor, the family doctor, if you will—that member of the medical profession called by the President and by Congress to direct the medical affairs of that "large family," the Army of the United States. Just as the family doctor would search through, study, and advise concerning every phase of family life, so The Surgeon General and the members of his corps concern themselves with every phase of army life.

*Read at the annual meeting of the Minnesota State Medical Association, St. Paul, Minnesota, May 28, 1941.

Perhaps my subject, "The Doctor in the New Army," can best be presented if we set up for ourselves an outline of the duties, or rather the missions, of the Medical Department. They may be stated as follows:

FUNCTIONS OF THE MEDICAL DEPARTMENT

I. Selection of Personnel
   A. Physical examinations
   B. Adequate records
II. Preventive medicine
   A. Hygiene and sanitation
   B. Immunizations
III. Curative medicine
   A. Rescue and transportation
   B. Hospitalization
IV. Final separation from service
   A. Examinations
   B. Records

As we discuss these various activities of the Medical Department, I suggest that each listener project himself into the picture as a player on the team. Each should remember that his position on the team may not be the post of his selection, but he can rest assured that the function he is performing is important in winning the game—winning the game, the price of which may be the life of the nation and even freedom itself.

Need I recall to you the fact that until modern medicine was born, the profession never really sold itself to "a nation in arms." Until the doctor could weed out the physically unfit by physical examinations, until he could cure the sick and heal the wounded, his work in the Army was a mere gesture of mercy, unorganized and almost unrecognized. How often during my twenty-six years of service I have heard some vexed line officer exclaim, "Oh, these .... doctors! Such a bother!" The warmest welcome I have ever received was on the south bank of the Ourcq, in the Aisne-Marne counteroffensive. I had just reached the embattled 39th Infantry, which had been without ambulance service many hours. The colonel exclaimed, "Hello, Medico! How'n h—did you get here? I am glad to see you."

Ever since the beginning of history that feeling in the hearts of men which has impelled them to go to the relief of suffering humanity, and which has impelled some of them to become doctors, has led medical men to the battlefield. The place of the doctor in the armed forces has been fairly won and honorably maintained.

Vast changes have occurred in the last one hundred and fifty or two hundred years. The history of our own Revolution shows that medicine of that day had so little to offer that frequently the doctor, always a leader in his community, appeared upon the battlefield not in his professional rôle, but as the organizer and the leader of combat units. General Warren who fell that day at Bunker Hill was not a soldier, but was a leading doctor in the Massachusetts Colony. It was he who led the Minute Men. It was he who set the British columns flying from Concord and Lexington, bottling them up in Boston. In the combat at Bunker Hill Warren relinquished his command to those better trained in military affairs. He fought as a private. There is no doubt that before receiving his fatal wound that day, he attempted to succor those about him who were injured, but there was no organized effort at medical care.

Frederick the Great stated that General Washington was the most brilliant military leader in his generation. It is interesting to note what Washington had to say about military medical service. I quote: "Each regiment should have at least two good doctors, and there should be a hospital somewhere in the rear where the sick could be cared for." Apparently the possibility of an organized rescue, first aid, and transportation of the wounded to a place of safety during the combat had never occurred to him. It remained for Larry, Napoleon's great army surgeon, to conceive the idea of the "Flying Ambulance."

It remained for our own Jonathan Letterman to organize a complete medical service with first aid detachments, dressing stations, ambulances, hospitals, and a well-conceived system of supply—and to prove its efficiency in the battle of Chancellorsville. How disheartening it must have been for him in the Gettysburg campaign to have had his medical wagons turned back, first by General Hooker and again by General Meade—this for fear that the valuable material might fall into the hands of the Confederate Army—and finally to come to battle without dressings, tentage, blankets, medicines and food for the wounded. Even opiates and anesthetics were on the medical purveyor's wagons, a full day's march from the field—a full day, even had they been able to advance over roads which were clogged with other traffic.

Largely from the lessons to be gleaned from

this disrupted medical service in the Gettysburg campaign has come our present organization which fully recognizes the necessity of placing each echelon of medical service under the command of medical officers. Many doctors have said to me, "I see no necessity for placing a doctor in command of ambulances. It is wasting a trained man." Experience has demonstrated time and time again that only the trained medical man with an understanding of the needs of the medical men who minister to the wounded can be depended upon either to transport medical supplies to the front or to transport the wounded from the front to the hospitals. But more of this later. Let us return to Section One of our table.

I. Selection of Personnel

The importance of a searching physical examination cannot be overemphasized. It is necessary that we weed out the physically unfit; else the Army will find itself encumbered by individuals who cannot carry on, and at a later time the pension rolls will bear the names of countless numbers of persons to whom the taxpayer owes not one iota of moral responsibility. Sick rates in any newly mobilized army will be high, and if the physically unfit are not left at home, the medical service will be overrun and will not be able to function properly.

II. Preventive Medicine

The doctor in uniform, above everything else, must be a practitioner of preventive medicine. He is a "public health officer." It is his duty to keep his soldiers well. Any good doctor can be depended upon to handle his patients in a creditable way, to give excellent treatment. Relatively few, however, are so well equipped in the field of preventive medicine. Most are not qualified in matters pertaining, for instance, to water supply, to sewage and waste disposal, to the inspection and preparation of food stuffs, or to the handling of epidemics. For this most important work the average doctor has had no practical training, and, I fear, in many cases even no classroom training of the basic sort. His general training is excellent, his basic information is sound, and once he turns his mind and his energies to the task, his results are good.

May I point with pride to the medical records of the World War, when for the first time in the history of the United States an armistice day found us with battle deaths outnumbering deaths from illness? That it was not always thus in evidenced by the records. We are told that the Revolutionary soldier had about seven times as many chances of dying from disease as of being killed by a British bullet. The record is something like four or five to one in the Mexican War and certainly not better in the Civil War.

In the Spanish American War the record was so poor as to be a scandal. In this war for the first time in the history of the world large numbers of men were mobilized who were non-immune to many of the communicable diseases. The soldiers of that day who came from the cities left water-borne sewage systems, carefully selected water supplies; they left refrigeration and a better milk supply, food selection, and, above all, they left screening against the fly. Even the ruralists were in some measure protected by these sanitary practices. Once the men were in camp and shorn of these protections, devastating epidemics of food-borne, water-borne, fly-borne and mosquito-borne diseases occurred. But why dwell upon the dark page of morbidity and death?

Necessity is the mother of invention; and so the profession at large and particularly the Medical Department of the Army really went to work. Came shortly the work of Walter Reed and Gorgas on the mosquito, the work of Darnell in chlorination of water; then came vaccination against typhoid and a host of other protections, until preventive medicine can be said to be at least adolescent. Every city, every hamlet, almost every household is now, in some measure at least, happier, better, and healthier because of this great branch of medicine.

But to the field of military medicine this happy state of affairs has added a great task, a tremendous responsibility. Never before has this nation, or any other nation for that matter, in mobilizing its man power found such a group of young men who are non-immune to communicable disease. The danger of epidemic is greater than ever before in our history. Never has the profession met such a challenge! Yes, the doctor in uniform must above all things else practice preventive medicine. And I may add that when and if you are called to the colors, the Army will make no apologies to you for being very exacting in its demands of you in this field.

III. Curative Medicine

The doctor in civilian life when called to care for the sick or injured usually finds his patient in bed in a home or in a hospital. We have become so accustomed to the conveniences with which the sick are surrounded that we accept them as a matter of course, and as no concern or responsibility of the practitioner. In the home there is a well-planned kitchen, there are loved ones to act as nurses, the most needed articles for treatment are usually at hand, and the telephone at our elbow brings drugs, supplies and a nurse's help. Or let us suppose that our patient has suffered an acute illness or injury on the street or in the factory. A well-trained rescue squad, probably from the police department or from the city hospital, has come to him, has effected a rescue, has given first aid and has transported the sufferer to a well-equipped hospital. The doctor has only to familiarize himself with his patient's condition and begin his treatment. We give little thought to how these conveniences have been provided.

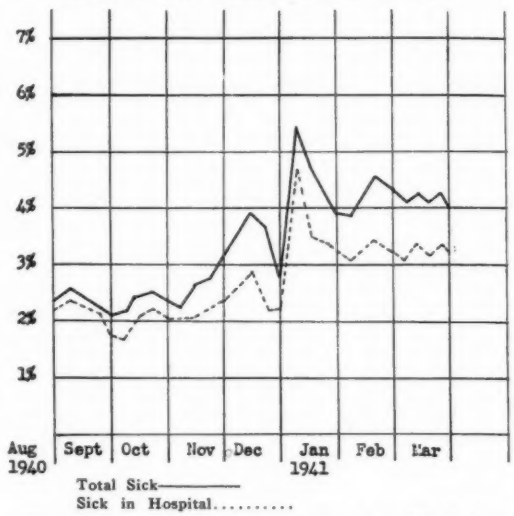
Not so in the Army. The Medical Department finds its patients sick in barracks or injured on the battlefield. It must provide first aid, transportation, hospitalization, and all the necessities for the treatment, as well as professional care itself. Following the general plan first clearly defined by Letterman (previously referred to), each regiment has its medical detachment, doctors and enlisted men who are trained to search out the sick, to give them necessary temporary care, and to prepare them for transportation to a hospital for definitive care. This may be accomplished either by litter or by ambulances; then we arrive at the hospital.

It has been the duty of the Medical Department to provide that hospital in its entirety, from foundation to shingle. Likewise it has been the duty of the Medical Department to provide every item of equipment needed therein, as well as the articles for treatment and transportation to this place of safety. It might interest you to note in passing that there are some seven thousand regular items on the Medical Department equipment list. I am particularly interested in the field we are discussing now because at the present time it is my particular duty to determine where our hospitals are needed, how large they must be and to secure their construction as a part of the regular building program.

With your permission I shall take up Section Four of our table and return later to the subject of hospitalization.

SICK RATE—U. S. ARMY

August 31, 1940 through March 29, 1941



The graph showing the sick rate in the new mobilized Army follows almost exactly the anticipated course. During the summer and autumn it did not reach 3 per cent. It rises abruptly during December and January and begins to fall at the advent of milder weather in February and March. It is noted that the rise in January is well over 5 per cent, which justifies the Surgeon General in asking for hospital bed capacity of 6 per cent of the total strength; i.e., 5 per cent in Station Hospital beds and 1 per cent in General Hospital beds.

IV. Final Disposition

Every individual who comes into the Army must at some time leave its ranks. This is true whether he be a regular officer, an enlisted man, or a draftee called for but a year's training. If the individual comes to the normal termination of his service, the Medical Department needs only make a careful physical examination to complete the record for the protection of the government and of the individual. There are many, however, whose service must be terminated prior to a normal expiration because of the effects of disease or injury. It is the function of the Medical Department to relieve the armed forces of these individuals who are not fit to carry on. This is a determination which must be made by the army doctor. Out of fairness to the individual and to the government a complete record must be made, and of course from the standpoint of humanitarianism, the individual will not be discharged until he has attained maximum hospital benefit.

Since the last war we have had a new conception of the country's responsibility to the disabled soldier. This is evidenced by the existence of our Veterans Bureau facilities with many hospitals throughout the country so that after discharge from an army hospital the disabled veteran need not feel that should his condition require it, he would want for further medical care.

The accompanying chart is a graphic representation of the sick rate in the entire Army within the continental limits of the United States from August 31, 1940, through March 29, 1941. Judging from studies and records of the World War, The Surgeon General estimated that our total disability rate from illness and injury would be something over 5 per cent. It was estimated that we would require 5 per cent hospitalization in our station hospitals with an additional 1 per cent in our general hospitals—a total of 6 per cent. That this estimate of the situation was correct is clearly demonstrated by this graphic representation of the sick rate of the last several months.

I should like to state in closing that we have made many mistakes, many of them errors in judgment. Most blunders or errors have occurred because of inexperienced construction personnel. It should be realized that there were just not enough skilled carpenters in the United States to construct the buildings in the time required. We have even had buildings fall down because they were not properly constructed. Inexperienced workmen have been injured and even killed because they did not know how to handle the timbers for the erection of these simple buildings. The wild haste to do overnight something that should have taken years to accomplish, the attempt to buy time with money, has been very expensive, but has not been without results in which we can take pride.

The Army makes no apologies for the decision of its Commander in Chief deferring the mobilization of personnel until adequate shelter, including hospitals, had been provided. This has worked grievous hardship. Individuals and even whole divisions have received warning orders and prepared to go to camp on a certain date, only to find that date put off from week to week because barracks and hospitals had not been completed. We feel, and so advised the Chief of Staff and the President, that it would have been criminal to allow the American youth, in a training program—not a war—to go to military rendezvous without the necessary facilities.

I am glad to report to you that as far as I am able to find out, no American boy in the uniform has suffered or has died for the want of medical supplies or because there was no hospital bed available for his care.

NUTRITION AND NATIONAL DEFENSE*

RUSSELL M. WILDER, Ph.D., M.D.
and
RAY D. WILLIAMS, M.D.
Rochester, Minnesota

WE are now engaged in a program of total national defense, and for this purpose we are mobilizing all of our national resources. Major industries have been reorganized to produce ammunition, guns, tanks and planes. But guns, tanks and planes are of no value without men. The supply of man power in the United States is not inexhaustible and modern weapons and war industry demand not only men but efficiency; men, as the President put it, "who are as good as their machines." The nutritional status of our armed forces has received first consideration, and rightly so, for they are our first line of defense. However, the armed forces ultimately will be no stronger and no more courageous than the people who support them. Battles have been fought and campaigns won without much thought being given to the nutritional status of the population at large, but famine has always contributed to defeat of armies and subjugation of nations. The courage, stamina, eagerness to coöperate and determination to win of collective peoples are national spirits which will determine the outcome of the present world-wide conflict and these spirits, so necessary if democracies are to survive the onslaughts now directed against them, are directly influenced by the nu-

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read by Dr. Williams before the meeting of the Minnesota State Medical Association, St. Paul, Minnesota, May 28, 1941.

tritional status of the masses of people. In our efforts to mobilize *all* of our national resources we must not forget one potentially tremendous resource, the good health of the masses of people. The backbone of our defense program is yet the men in the factories, in the fields, in the mines and in the offices, and of no less importance than these men are the families on whose health and happiness the workers so much depend for giving their greatest efforts. You cannot put into heavy industry a man who has been subsisting on a deficient diet and expect efficiency, unless you first build him back into an efficient human machine.

Therefore, the aim of the nutrition program for national defense is to raise the nutritional status of the American people to a high level as quickly as possible, and once the emergency is passed, to consolidate gains already acquired and others surely to accrue as a result of awakened interest in the field of nutrition.

Need of Nutritional Front

Formerly it was thought that famine could be prevented if only supplies of food energy sufficed. The newer knowledge of nutrition teaches us that food energy is not enough to provide stamina for war. Procurement of energy in the form of nonperishable flour and sugar is a simple problem in the United States. But protein must be had, and a modicum, about a third, must be of high biologic value, namely, the proteins found in meat, eggs, milk, cheese and a few vegetables. Fat is a necessity aside from its energy value. Unsaturated fatty acids, such as linoleic acid, obtained with difficulty from other foods than fat, are essential. Fat hunger is a reality and the people of Europe now are feeling it. Fats also carry fat-soluble vitamins and provide for absorption of carotene, the provitamin A. Carbohydrate is essentially an energy carrier, and very little of it is necessary for nutrition if calories are provided from other sources.

In America, with its bursting granaries, there is little hunger for food energy but "hidden hungers" are prevalent. The newer knowledge of nutrition has emphasized the importance of what were once called accessory factors, namely, certain minerals and vitamins. Calcium in many diets is less abundant than desirable. An intake of less than 0.8 gm. per "consumption unit" is considered unsatisfactory, and such an intake is difficult to attain unless a pint of milk, or its equivalent of milk solids in other forms, is included in the day's food. Many people in Minnesota, a dairy country, fail to drink milk. Iron often is lacking in diets when leafy greens are avoided or the allowance of meat is small. Iron anemia is a prevalent deficiency. Vitamin deficiencies constitute the principal "hidden hungers" which until lately for the most part were unrecognized. Vitamins are the integers of the enzyme systems of the body, and lack of them gives rise to physical and mental inefficiency long before outstanding or recognizable disease appears.

Our knowledge of the incidence of nutritional deficiency diseases is rapidly growing. Statistics gathered from hospitals and nutrition clinics in most instances are based on only that group of people who have manifest evidences of deficiency states, that is, who have scurvy, rickets, beriberi, pellagra or ariboflavinosis, and they do not describe the incidence of deficiency disease in that large group of people who are in borderline states of nutritional deficiency. The latter group of persons just have "poor health," cannot do an "honest day's work" and may never seek the services of a physician. Critical analyses of purchases of food by Americans as reported by Stiebeling and Phipard of the Federal Bureau of Home Economics, give us indirect but nevertheless valuable information on which to estimate the probable incidence of deficiency disease in the group of employed wage earners. The report shows that no more than a quarter of the urban and rural families of the United States have diets that can be rated as good, that a little more than a third have diets rating as fair, and that another third or more have diets classed as poor. We have heard expressions of skepticism about these conclusions, but support for them comes from the findings of many independent dietary surveys in which the food actually eaten was measured and the people were examined by physicians. Wherever such surveys have been made the findings were much the same.

The actual incidence of nutritional deficiency states will be determined only after we have learned to recognize the early manifestations of deficiency syndromes, that is, before they have progressed to a state which can be called disease. Our conceptions of vitamin deficiency states have changed rapidly since easy availability of crystal-

line vitamin preparations has made it possible to induce an isolated vitamin deficiency under carefully controlled conditions. Jolliffe and his co-workers at Bellevue, and more recently Williams and his co-workers at the Mayo Clinic, induced isolated vitamin B_1 deficiency states in human subjects. During a study of only moderate restriction of thiamin, Williams and his coworkers observed that cheerful, happy, industrious young women became morose, depressed, fearful, irritable, uncoöperative, slovenly in personal appearance, easily fatigued, making numerous vague complaints of eye strain, headache, palpitation of the heart and dyspnea on exertion, capricious appetite, anorexia and gastric distress after meals. All of these signs and symptoms slowly disappeared when thiamin was provided in adequate amounts. In earlier studies[6] of severe restriction of thiamin, although heart failure, edema and polyneuritis—conspicuous features of classic beriberi—were not observed, objective evidences of irregularity of heart action, disturbance of gastro-intestinal function, impairment of the ability of the body to utilize carbohydrate and elevation of concentrations of certain chemical constituents of the blood were observed. But a most striking feature of the disease induced by the isolated withdrawal of thiamin was the fatigue and lassitude observed in all subjects after several weeks of restriction of thiamin. The disease induced by the isolated withdrawal of thiamin resembled, minutely in the early stages, the disorder which the discriminating psychiatrist designates as neurasthenia, or as it is commonly called, chronic nervous exhaustion.

Similarly, prepellagrous states are being recognized. J. S. McLester wrote: "Since J. B. McLester in his study of the histories of pellagrins seen at the Hillman Hospital in Birmingham made the significant discovery that an appreciable number of these patients had been admitted the previous year under the diagnosis of neurasthenia, we have made an effort toward the early recognition of such cases of subclinical pellagra. Many of the patients recently studied could with some justice be called neurasthenic, but when given nicotinic acid and thiamin, with a diet appropriate for pellagra, they recovered their nervous stability and sense of well-being to a remarkable degree. I believe that with a good history the prepellagrous state can be recognized without great difficulty and further progress of the disease stopped."

Recently Sydenstricker wrote: "In the chronic partial deficiency of B vitamins . . . mild psychic disorders may precede other manifestations by weeks or months. Neurasthenic complaints of all sorts are common. Slight mental retardation, loss of memory for recent events, apprehension, confabulation, depression or mild delusional states may recur for months or years. Partial deafness, particularly for high pitched tones, may be the presenting symptom. Digestive disturbances, particularly gastric discomfort after meals, burning of the esophagus and stomach, flatulence and constipation are almost invariable . . ."

Lund and Cranden, in a study of experimental human scurvy, observed, among other things, slight lassitude and ease of fatigue in the fourth and fifth months of the study, and marked fatigability began only in the sixth month. No ecchymoses occurred and no changes of the gums.

The point we wish to make is this: nutritional deficiency states, which we shall soon learn to recognize in the early stages, will be found principally in that large group of people who just do not feel well, who tire easily, who complain of nervousness, of palpitation of the heart, of indigestion and of insomnia; that is, the people who have a multitude of complaints and in whom organic disease rarely can be demonstrated. We have implied that nearly all clinical vitamin deficiency states have one characteristic in common —a vague feeling of ill health which may precede by months or years the frank manifestations of deficiency disease. The state of poor health comes on so gradually that oftentimes the patient cannot date its onset, cannot attribute a cause and may be astonished to learn the true nature of his illness. Substantial evidence clearly indicates that a large portion of our population, rich and poor, young and old, subsist on intakes of certain vitamins and minerals which are incompatible with vigorous health, and to this extent the health and welfare of the nation are impaired.

The Nutritional Front: Plans and Personnel

The importance of the nutritional front received early recognition as the existing emergency developed, and a planning and policy committee on nutrition, representing different agen-

cies of the government, with Mr. M. L. Wilson of the Extension Service, Department of Agriculture, as chairman, was appointed. The committee now is advisory to the Director of the Office of Defense Health and Welfare Services, Mr. Paul V. McNutt. Plans to mobilize the scientific talent and educational resources, not only of the Federal Government but of the nation, are being put into effect.

The plans involve: (1) reinforcement of present activities of the many agencies of the government that have nutritional programs; such agencies as the Federal Security Board, United States Public Health Service, Extension Service and Bureau of Home Economics of the United States Department of Agriculture, the Maternal and Child Health Section of the United States Children's Bureau, the Home Economists of the Works Progress Administration, and others; (2) measures for increasing the food purchasing power of the low income group in which extension of the stamp plan of the Federal Surplus Commodities Corporation may be sought; the school lunch program looms large and must be extended; (3) measures directed to improving the nutritive quality of staple foods with special emphasis at first on flour and bread; (4) measures for disseminating information on food selection through the medium of the press, magazine, radio, lectures, and so forth; (5) the assistance of professional groups, foremost that of physicians. Support from the family physician is indispensable, but so also is that of dentists, nurses, dietitians, social workers and others who can influence nutritional practices.

In our democratic country the masses of people must accept national problems and methods of solving them before effective action can be taken. If we can bring the masses of people to understand the nature and extent of the problem of malnutrition and the application of the simple principles by which dietary deficiencies can be corrected, we shall have gone a long way toward the goal of improving the health of the nation and fortifying one of our many lines of national defense. Education of the public in nutritional practices is largely in the hands of groups who work intimately with the people. No other group in the state of Minnesota can have greater influence on dietary habits of the people than the practicing physicians and their help is urgently needed for effective application of plans for "making America strong by making Americans stronger."

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PHYSICAL DEFECTS OF SELECTEES*

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WITH the enactment into law of the Selective Training and Service Act of 1940 by the Seventy-sixth Congress, a vast machine for the procurement of men for a rapidly expanding defense program was authorized.

For administrative purposes, the President established a National Selective Service Headquarters and authorized the Governor of each State, who is responsible for the administration of the act, to establish a State Headquarters under a State Director and delegate to it the administration of the Act within the State. Thirty days after passage of the Act sixteen and a half million men, between the ages of twenty-one and thirty-five years, were registered for Selective Service on October 16, 1940. Of this number,

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331,285 were registered in the State of Minnesota.

In each of Minnesota's eighty-seven counties at least one local board was established and in order to have a local board available for each 30,000 of population, in a number of counties, two or more boards were established, making a total for the State of 137. These boards are composed of three or more members appointed by the President, upon recommendation of the Governor. They were chosen from male citizens of the United States who are not members of the land or naval forces and preferably residents of the area for which their board was appointed, or at least residents of the county in which their local board has jurisdiction.

The duties of the local board are classification, selection and delivery for induction. On the successful and just execution of these duties depends entirely the success of the Selective Service System. The Act authorized the appointment by the President, on the recommendation of the Governor, one examining physician for each local board to examine registrants for the local board but not to serve as a member of the local board, as in 1917-1918. While one physician only was appointed for each board in the beginning, the Act authorized the appointment of additional examining physicians at the request of the local board. So that beginning with 137 examining physicians in October, at the present time we have 664. Recently the appointment of dental examiners for each board has been authorized and to date we have 235 dental examiners for local boards.

The Act authorized the establishment of Medical Advisory Boards to be made up of one or more of each of the specialties for each board, so that at the present time we have nine Medical Advisory Boards with 142 members who are daily rendering opinions in difficult cases referred to them by examining physicians or local boards.

To date then, approximately 1,000 members of the medical and dental professions have examined over 35,000 registrants in the State of Minnesota; 64 per cent of these have been found to be fit for general military service; 13 per cent fit for limited military service, having certain minor defects which prevent them from being certified as fit for general service; and 23 per cent have been disqualified as unfit for any military service.

DEFECTS CAUSING DISQUALIFICATION

	1941	1917-1918
Teeth (insufficient)	29.0	3.1
Cardiovascular	16.0	13.1
Nervous and Mental Disorders	9.0	10.3
Musculoskeletal	9.0	12.3
Multiple defects	6.0	
Ears	5.0	4.4
Eyes	4.0	10.6
Endocrine	2.0	
Gastro-intestinal	2.0	
Hernia	1.8	6.0
Respiratory	2.0	
Genito-urinary	1.8	2.6
All others	7.0	

The situation in Minnesota with regard to syphilis, as disclosed by serological examination of every registrant physically examined, is gratifying. From November 6 to April 13, 30,891 serological examinations were performed on 30,333 registrants. Of this number of examinations 181 positives were found, 105 of these 181 positives being known cases that were already under treatment, leaving 76 new cases discovered in 30,333 men.

The causes for rejection by local board examiners and members of the examining team at the induction center are numerous. However, without wishing to burden you with statistical data, I might say that the chief cause for rejection by the examining physicians for the local board and the induction center is insufficient teeth. Approximately 29 per cent of the registrants found not fit for general military service by both the examining physicians and the induction board were rejected by reason of insufficient teeth. Approximately one out of six were rejected because of cardiovascular defects. One out of ten of the rejections were due to musculoskeletal or orthopedic defects or diseases of the bones and joints. One out of ten was rejected because of insufficient vision, hearing, or diseases of the ears or eyes which were disqualifying; and one out of ten for nervous and mental disorders.

The reasons and percentages of rejections for certain causes at the present time are about parallel and comparable to the defects causing rejections in 1917-1918, with the one notable exception that while at this time 29 per cent of the

rejections are due to insufficient teeth, this defect or deficiency caused only 3 or 4 per cent of the rejections in 1917-1918. Whether this is indicative of a lack of care with resultant deplorable conditions of the teeth at the present time in comparison with that of 1917-1918, or whether it is indicative simply that standards are being more rigidly applied at the present time, I am entirely unable to state.

To April 30 of this year, 10,682 men were forwarded to the induction center at Fort Snelling by the local boards. Of this number, 1,236 or 11.6 per cent were rejected at the time of the final type physical examination performed by the induction board, for physical reasons. It is interesting to note the variation in percentage: 2.4 per cent of the total delivery by one board were rejected while 28.3 per cent of those delivered by another board were rejected, the average being stated above, 11.6 per cent for all boards.

The figure of 11.6 per cent of rejections at the induction center is slightly below the average for the Nation, and far below figures for some of the other States. However, the rejection of one out of every eight or ten men delivered to the induction center has ben the cause of much criticism of the Selective Service System, the standards for physical examination and the profession. It means that in many cases, registrants have left their occupations or disposed of their business, said good-by to their families and friends, planning for a year's service and training and several days after their departure for the induction center they are returned to their home station, considerably lower in spirit and morale than on their departure and ofttimes without a job.

To remedy this situation, numerous plans have been advocated. One plan suggested the elimination of the preliminary examination by local board examiners entirely, and the forwarding of all registrants to the induction center where they would submit to the final type of examination, following which those found fit for general military service would be inducted in their proper order. A second plan suggested a traveling induction board made up of Army Officers, which would tour the State and examine registrants at numerous points throughout the State. A plan which is being tried this month in Pennsylvania, proposes the continuance of the examination as heretofore by physicians for local boards, this examination to be followed by the final type examination by an induction board several weeks previous to induction at various points in the State convenient to groups of registrants. Local boards, under this plan, would order groups of registrants to a certain point in the locality where they would be examined by an induction board composed of Army Medical Officers, or of available civilian specialists in the vicinity, and after the completion of the examination, registrants would return to their home station. They would then know definitely their physical status several weeks prior to induction and on notification that they were to be inducted could make their plans for leaving their jobs or disposing of their businesses with the assurance that on induction they would be accepted into the Army for a year's training.

At the present time tentative plans are being made in each State in an attempt to avoid registrants being returned from the induction center because of rejection for physical disability. When a workable plan has been perfected to accomplish this, I am sure that one of the few causes for criticism of the Selective Service System will have been eliminated.

NEW ARMY IN EXCELLENT HEALTH

It should be a source of great public satisfaction that the health of America's new army is being maintained at a high level. This reflects both the careful selection of the men and the high quality of the medical supervision and care provided for them. While no separate figures are collected for the recent selective service men, they have come to form so much the greater part of the forces in service in the United States that, more and more, the current sickness experience of the army applies to them in particular.

For several months now—from April to August 1941—the total rate of admission to "sick report" for disease has run appreciably lower than in the corresponding period of 1918. The current experience is even more favorable when we consider that military training now makes greater physical demands than a generation ago. Moreover, soldiers are now encouraged to report illnesses, however minor, to prevent their becoming serious as a result of complications; in fact, some of the disorders now recorded would not usually cause absence from work in civilian life.—*Statistical Bulletin,* Metropolitan Life Insurance Company, September, 1941.

MEDICAL OFFICERS OF THE FUTURE*

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WHEN the Program Committee invited me to participate in this symposium and discuss the subject, "Medical Officers of the Future," I feel sure that they intended that I should consider the special qualifications and training which physicians should have in order to be able to meet the future medical needs of our armed forces. Before turning to this aspect of the subject, however, I should like to discuss briefly with you the vital and even more fundamental problem of providing an adequate supply of medical officers to meet the demands of our defense program.

Necessity for Continuance of Medical Training

Briefly stated, the situation with which we are faced is this: For the present Selective Training and Service program the Army will require 7,900 physicians, in addition to the 1,200 medical officers in the regular Army. If the training program is expanded or there is a general mobilization, this number will be proportionately increased. For example, if there should be a mobilization of four million men, the Army will need to call approximately 25,000 physicians from civilian life.

In addition to this the Navy will need approximately 900 additional physicians for their expanding program; the new and enlarged defense industries will require the services of many physicians; the Public Health Service needs more doctors, and experience shows that modern warfare increases enormously the need for medical services among the civilian population. Recently the British Red Cross has urgently requested 1,000 American physicians for duty in England.

The question naturally arises as to why the military training program or mobilization creates a shortage of medical services when the same individuals who are in the armed forces were previously supplied with medical care in civilian life. The answer is that the quota of medical services in the armed forces is approximately five times as high as it is in the civilian population: namely, 6.5 per thousand individuals in the Army as compared to approximately 1.5 per thousand in the civilian population. In the training program such a high ratio of physicians may not be necessary but in order that the armed forces may be properly and effectively trained for actual warfare it is considered important that all units of the service be trained for effective coordination at combat strength.

As I have already pointed out, for the present training program of 1,400,000 men, the Medical Corps of the Army will require approximately 8,000 physicians from civil practice. Of these, a few will be inducted by Selective Service but most will be physicians who hold commissions in the National Guard or the Medical Reserve Corps.

To withdraw 8,000 physicians from practice will create shortages in medical service in certain areas. The adjustments which are necessary to meet this situation constitute one of the problems facing the medical profession today.

The Surgeon General's Office estimates that possibly 50 per cent of the physicians who go into military service from civil life will be willing to continue in the service for more than one year. This estimate seems to me rather optimistic but even if it should prove correct, it will require 4,000 new physicians for the military service each year to replace those who return to civil practice.

In normal times it requires from four to five thousand medical graduates annually to take the place of the physicians who discontinue practice because of age, disability or death. Therefore, the physicians who return to civil life after a year of military training will be barely enough to provide for this replacement.

This leaves the question of an annual replacement of 4,000 physicians for the military services, in addition to the provision of approximately 500 to 1,000 physicians for replacements in other governmental services. The Surgeon General of the Army estimates that the Medical Reserve Corps will be exhausted by July, 1942, hence, it is obvious that these replacements must come primarily from the graduates of our medical schools. The approved medical schools of this

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country are able to graduate about 5,000 physicians a year. It is estimated that 30 to 40 per cent, or at least 1,500, of these will not be qualified for Army service because of physical defects, sex, prior commissions in the Navy, dependents, etc. This leaves only approximately 3,500 medical graduates available to serve as medical officers. From these data it is obvious that even if the number of graduates from medical schools is continued at the present level and every physically qualified graduate enters military or naval service upon graduation, it will still be necessary to draw an additional 1,500 physicians from the civil population each year in order to meet the needs of the armed forces.

The reason for bringing this to your attention is that at the present time, the responsibility for granting deferment of military service to medical students rests with Local Boards or Appeal Boards of Selective Service. If medical students are withdrawn from school and inducted into the army, the vacancies in their classes remain unfilled because there are no replacements available. The inevitable result will be a decrease in the number of physicians to be graduated in the years ahead. Furthermore, if these students return to complete their medical courses after their military training, they will have discharged their obligations under the Selective Training and Service Act and so cannot be expected to accept additional training service after graduation.

The National Headquarters of Selective Service has advised Local Boards of their authority to grant deferment to students who are considered "necessary men" in training for an occupation or profession which is essential to the "national health, safety or interest" and in which there is a present or probable shortage of trained personnel. In addition, both National Headquarters and Minnesota State Headquarters have issued memoranda to Local Boards providing data and factual information concerning the need for and relative shortage of physicians, and advising that no student "who gives reasonable promise of becoming an acceptable medical doctor be called to military service before attaining that status." This is as much as National and State officers can do under the law. The ultimate decision rests with Local Boards or Appeal Boards.

The University of Minnesota has given careful consideration to the problem of deferment of military service for students and has decided to recommend deferment for those students who, in the opinion of the appropriate University authorities, should be granted deferment in accordance with the provision and intent of the Selective Service Act. Medical students are included in the preferred groups for whom recommendation will be considered. There will be no group recommendations. Each individual student will be given special consideration on the basis of his progress to date, his class standing, and the probabilities of his successful completion of the course within a reasonable time. Recommendations will be initiated by the Dean, passed upon by the University Committee on Deferment of Military Service and transmitted to the President for his consideration and recommendation to the Local Boards.

It is our hope that Local Boards will act favorably upon these individual recommendations, each of which will have received careful consideration by the University before submission to the board. In order to obtain favorable action, however, it is essential that Local Boards have a clear understanding of the situation. They must understand that no exemption from military service for these students is even suggested. Every one of them who is physically fit will be obligated to go into the military service upon the completion of his medical course. Under the present law this is the only way in which our armed forces can obtain the services of the physicians which they need. The only alternative would be a special draft for physicians, and even that would create serious shortages of medical service for the civilian population. To avoid such catastrophe, it is essential that physicians, health officers and others who understand the urgency of the situation do everything in their power to convince Local Selective Service Boards that deferment of military service for medical students is essential both for the defense program and for the national welfare.

Special Qualifications for Medical Officers

Next, let us turn to the more direct consideration of the subject assigned to me: namely, the qualifications of Medical Officers of the Future. In view of the inevitability of military or naval service for every qualified medical graduate it is obvious that our medical schools have become

training institutions for medical officers as well as for physicians to serve the civilian population. This raises the question as to the type of training that these future medical officers should have. First and foremost every medical officer must have a sound and thorough medical education. Specific evidence of the official recognition of this basic requirement is the regulation that only graduates of approved medical schools are eligible for commissions in the Medical Corps of the Army and the Navy. This much is an accepted requirement. The next question is whether the curriculum which has been formulated primarily for the training of civilian physicians should be modified for the training of medical officers, and, if so, in what manner.

The Care of Emergencies

The needs for medical services in times of war are largely of an emergency nature. In modern warfare this is just as true among the civilian population as among the armed forces. Consequently, physicians will be called upon to meet many more emergencies of all types than in peacetime practice.

With this in mind the medical faculty of the University of Minnesota introduced, approximately a year ago, a special course in first aid for freshmen medical students. The instruction and practice in this course provides these students with a background for dealing with most of the emergency situations with which they may be confronted either as medical students or as physicians. This course has been popular with the students and in addition to its own intrinsic value it has served to stimulate their interest in certain of the fundamental science courses such as anatomy which they are studying at the same time.

The medical officer must be familiar also with the best methods of dealing with the special hazards of modern war, such as various types of wounds, burns from gas, incendiary bombs and flame throwers, poison gas inhalation, etc. Special bulletins on these topics are being prepared for the Medical Department of the Army by special committees of the National Research Council. Copies of these may be obtained from the Government Printing Office.

Special Physical Examinations.—Important among the special skills of medical officers is the ability to make discriminating physical examinations of new recruits. It is essential both that disqualifying defects be recognized and that unimportant physical findings be properly devaluated. Tuberculosis alone among the soldiers of the last war has already cost this country approximately a billion dollars for hospital care, insurance, compensation and vocational training, and these expenditures are still continuing at the rate of about three million dollars per month. Some of these infections doubtless were acquired in service, but unquestionably the great majority of them were present, although unrecognized, at the time that the infected individuals entered the service. It has been estimated that it costs about $10,000 to induct a man suffering from tuberculosis and about $50 per month thereafter, plus compensation benefits for his dependents after death.[1] The use of modern diagnostic techniques makes it possible to recognize practically all of these infected individuals at the time of the examination. Our medical officers should be trained and provided with the facilities to use these techniques.

Other aspects of the physical examination for which special skills are necessary are the interpretation of heart murmurs, the estimation of cardiovascular efficiency, the neuropsychiatric examination, and examination of the eyes and ears, particularly for aviators.

Psychiatric Problems of War Time.—Medical officers of the future need to be specially trained in the field of psychiatry. War has always precipitated latent emotional instabilities into incapacitating psychoses or psychoneuroses. During the past war we labeled many of these as shell-shock. By so doing we felt, all too frequently, that we had accomplished something, although the understanding and the treatment of the patient was not improved in the least by the use of this new terminology. The loss in efficiency of the armed forces occasioned by emotionally unstable soldiers is enormous and the cost to our government for the care of the psychiatric patients in the last war has long since passed the billion-dollar mark.

In building an army, the emotional stability and morale of the soldiers are of vital importance. Modern warfare utilizes the instillation of fear and the war of nerves as potent weapons. The dive bombers, screeching shells, incendiary bombs, parachute troops, sabotage, interruption of communications are demoralizing in their ef-

fect. French resistance melted under it when pitted against the German army whose morale, according to William Shirer,[7] was "fantastically good." As an example, he mentions "a company of engineers that was about to go down to the Scheldt River to lay a pontoon bridge under enemy fire. The men were reclining on the edge of a wood reading the day's edition of the army daily paper, the *Western Front*. I have never seen men going into battle from which some were sure never to come out alive so—well, nonchalant."

Under such conditions emotionally unstable soldiers are not only worthless to an army but a distinct liability. They never make good soldiers and as many of them as possible should be excluded at the time of the entrance physical examination. Special skill, care, training and time are necessary to identify these potentially psychopathic individuals and prevent their induction into the Army. Many, however, are certain to again get into our Army. For these the medical officer must be constantly on the alert. Under military training, emotionally unstable individuals are almost certain to exhibit suggestive symptoms. Their commanding officers may note that they do not accept discipline or develop well under training. Such symptoms should be called to the attention of the medical officer, who, in turn, needs special training and experience to deal effectively with these problems.

At the University of Minnesota we have been able, during the past few years, to greatly strengthen the psychiatric training of our medical students. The addition of the psychiatric unit to the University Hospital has enabled us to institute clinical clerkship training in this field. Still more recently we have been able to add experience in the Psychiatric Clinic for Children, where the students have had an opportunity to study the diagnosis and treatment of emotional instability in its early stages. All of this, however, will be supplemented for these future medical officers whom we are training with special instruction concerning the psychiatric problems of modern warfare.

Public Health Responsibilities of Medical Officers.—Another major responsibility which a medical officer must assume lies in the field of public health, particularly in epidemiology and sanitation. It is the medical officer in the Army who is responsible for the prevention and control of communicable diseases, for the general sanitation of the camp, and for the safety of food, milk and drinking water. Upon his competence in these fields may depend the health and effectiveness of large numbers of troops. Outbreaks of epidemic diseases practically always accompany the mobilization of armies. During the last war, measles, mumps, meningitis, influenza and pneumonia occurred in epidemic proportions in many of the camps and greatly reduced the effectiveness of large units of the Army. Adequate safeguards over food and drink can easily be established in permanent or semi-permanent camps; but the modern, rapidly moving army, frequently operating in small units, must be prepared to meet these hazards in an emergency manner. Medical students are regularly given instruction in these subjects but additional emphasis needs to be placed upon them in order that our graduates may be qualified for these special responsibilities which they will be called upon to assume.

Administrative Responsibilities.—Still another requirement of the competent medical officer is an understanding of the organization and operation of an army and particularly of its medical department. In time he will learn much of this by experience but he will be able to discharge his responsibilities more promptly and more efficiently if he has as much familiarity with his duties as possible before being called upon to accept them. In our defense program time is an all important factor. Special series of lectures are being given to our senior medical students who are not in the Reserve Officers Training Corps course to acquaint them with the administrative duties and relationships of medical officers.

Need for Specialists.—These are some of the qualifications which medical officers as a group should possess. In addition, the medical officer in special situations needs still further qualifications. The surgeons, the internists, the radiologists, and the other specialists who are assigned to military or naval hospitals need to be thoroughly competent in their specialties and familiar with their application to war casualties. The flight surgeon must be skilled in the physical examinations required of aviators and thoroughly acquainted with the special medical and health problems of aviation, such as fatigue, aerial

equilibrium, air sickness, effects of decreased atmospheric pressure, evacuation of war wounded by airplane ambulance, etc.

Medical schools have recognized their responsibilities for the better preparation of medical officers and are attempting to meet them. The Army will provide a certain amount of training as well as experience for medical officers after they are called to active service. In addition to all this, the individual physician should prepare himself, so far as possible, for the special responsibilities which he may be called upon to assume either in the armed forces or among the civilian population during the modern war. Much can be done in this regard with the aid of such books as "The Military Medical Manual";[5] Dunham's "Military Preventive Medicine,"[6] Armstrong's "Aviation Medicine,"[1] the bulletins published by the Government Printing Office for the Medical Departments of the Army and the Navy, the Medical Preparedness Section of the *Journal of the American Medical Association,* and the new journal entitled *War Medicine* published by this same association.

As a profession let us prepare ourselves as quickly and as effectively as possible for the important part which medicine must play in our National Defense Program.

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CHEMOTHERAPY IN THE TREATMENT OF STREPTOCOCCAL INFECTIONS*

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THE use of chemotherapy in the treatment of infections produced by pathogenic bacteria belonging to the rather large group classified as streptococci has modified the practice of medicine greatly in the past few years. The variability of the response of infections due to different strains of streptococci is an important factor in the selection of the drug most suitable in each instance. The proper selection of the drug of choice, the dosage and the method of administration are by far the most important considerations in determining the results obtained in this form of treatment. An attempt will be made here to record on a basis of our experience the methods of choice in the treatment of various types of infections in which streptococci have been the etiologic agent.

Infections Due to Hemolytic Streptococci

In general, infections due to hemolytic streptococci may be classified in three major groups: (*A*) those infections resulting in a very acute fulminating disease in which high concentrations (12 to 16 mg. per 100 c.c. of blood) of the drug in the blood stream are not only desirable but imperative in order to obtain satisfactory results. In this group will be found septicemia, meningitis, fulminating infections of tissues including erysipelas, puerperal sepsis with peritonitis, and so forth. The second group of infections (*B*) includes those which are moderately severe but in which lower concentrations of sulfonamide compounds (5 to 9 mg. per 100 c.c. of blood) are satisfactory. In this group will be found abscesses, adenitis, cellulitis, lymphangitis, tonsillitis and peritonsillar abscess, and sinusitis. A third group of infections (*C*) in which low concentrations (3 to 4 mg. per 100 c.c. of blood) are required includes infections of the urinary tract.

Chemotherapy in Group A.—It is in the first group of cases referred to that the adequacy of treatment is of prime importance. Sulfanilamide still remains the drug of choice in the treatment

*From the Division of Medicine, The Mayo Clinic, Rochester, Minnesota. Read by Dr. Herrell before the annual meeting of the Minnesota State Medical Association, St. Paul, Minnesota, May 28, 1941.

TABLE I. SULFONAMIDE TREATMENT FOR STREPTOCOCCAL SEPTICEMIA

Comparison of Results in Cases With and Without Treatment

Organism	Sulfonamide compounds 1937–1940			No sulfonamide compounds 1934–1940*		
	Total patients	Recovered No.	Recovered %	Total patients	Recovered No.	Recovered %
Hemolytic streptococcus	47	30	64	69	19	28
Streptococcus (green producing) †	12	9	75	7	5	71

*Quantities under this heading include those patients who, although the drugs were available through part of the period concerned did not, for some reason, receive them.

†There were also 177 cases of subacute bacterial endocarditis from 1934 to 1940, inclusive, with no recoveries regardless of type of treatment.

of septicemia due to hemolytic streptococci. The drug may be administered by mouth or subcutaneously. Initial doses of 3 to 3.5 gm. followed by 1 gm. at four-hour intervals throughout the day will result usually in adequate concentrations. Sulfanilamide administered subcutaneously, for instance, 0.8 per cent solution in saline, is used only in treatment of patients who are unable to take medication by mouth. In such cases our procedure has been to administer 400 to 500 c.c. of such a solution as an initial dose and to repeat the subcutaneous medication every six to eight hours as necessary to maintain the desired concentrations in the blood. The additional administration of sodium bicarbonate, 40 to 60 grains daily, is indicated, since acidosis develops in some instances when patients receive sulfanilamide.

Sulfapyridine given orally or intravenously in the form of sodium salt in a 5 per cent solution in distilled water may be used also in the treatment of hemolytic streptococcal infections of the severe type. In fact, this drug is particularly suitable in the treatment of streptococcal meningitis. These patients often are unable to take medicine by mouth and the intravenous use of sodium sulfapyridine affords a method of quickly arriving at concentrations desirable in the treatment of meningitis. Soon after the administration of 50 to 75 c.c. of the solution, the concentration in the blood will range between 4 and 5 mg. per 100 c.c. If the total daily intake of fluid does not exceed 3,000 c.c., the concentration of sulfapyridine may be maintained by repeating the intravenous doses at six-hour intervals. Sulfathiazole is not considered useful in the treatment of meningitis due to hemolytic streptococci, since it has been shown that this drug does not diffuse readily into the cerebrospinal apparatus.

Perhaps the greatest single factor in the possible recovery of a patient suffering with either septicemia or meningitis is the adequacy of treatment and likewise the most important single factor concerned in the adequacy of treatment is the maintenance of a concentration of sulfonamide compounds between 12 and 16 mg. per 100 c.c. of blood. This is indicated clearly in the results which were reported by us[4] in the treatment of septicemia over a three-year period between 1937 and 1939. Approximately 70 per cent of patients suffering from hemolytic streptococcal septicemia recovered if adequately treated. On the other hand, the recovery rate was only 30 per cent in the cases in which treatment was inadequate. This recovery rate in the latter group is no better than the recovery rate reported by Rosenow and Brown for a similar period before sulfonamide compounds were available. This observation serves merely to reëmphasize the fact that, if one is not willing to treat patients with these drugs in amounts necessary to maintain the blood concentrations at the higher levels, the results are no better than if chemotherapy is completely withheld from the patient.

A recent analysis of the results in the treatment of septicemia including our experience for the past four years again emphasizes this factor vividly (Table I). Failure to recover from septicemia can be explained now only on one or two factors. The first is the question of adequacy of treatment, in which lies the only hope for improvement in recovery rates in this group of cases. The other factor which will account for failures if patients are treated adequately is the development of a vegetative heart lesion or infected thrombophlebitis during the course of treatment. When such a condition ensues, one is dealing with a focus in direct communication with the blood stream, and such a focus results in a prognosis identical with that which exists in the treatment of subacute bacterial endocarditis.

It has been pointed out previously that the factor of age has been considered very significant in the possible recovery of a patient suffering with septicemia. For example, Rosenow and Brown reported a 9 per cent recovery rate among

patients fifty years of age or more suffering from hemolytic streptococcal septicemia up until 1936. In the past four years, since the advent of chemotherapy, we have observed a recovery rate of 59 per cent among patients fifty years of age or more (Table II). Better than a sixfold improvement in a recovery rate for patients in this age group is ample justification not only for the existence but the continuation of the methods which have been employed.

TABLE II. SULFONAMIDE TREATMENT IN HEMOLYTIC STREPTOCOCCAL SEPTICEMIA
Age Factor in Cases With and Without Treatment

Age, years	Sulfonamide compounds 1937–1940			No sulfonamide compounds 1934–1936		
	Total patients	Recovered		Total patients	Recovered	
		No.	%		No.	%
0–24	11	10	91	14	8	57
25–49	19	10	53	25	8	32
50 and more	17	10	59	22	2	9
Total	47	30	64	61	18	30

Chemotherapy in Group B.—The early oral administration of adequate doses of sulfanilamide or azosulfamide (neoprontosil) in the group of cases classified here in group B is perhaps the greatest single factor in the prevention of the development of the more severe complications of streptococcal infections found in group A. The early administration of these drugs in treatment of ordinary abscesses, cellulitis, lymphangitis and even sinusitis not only may shorten the course of the patient's illness but at the same time may prevent septicemia and meningitis, the mortality rates for which are extremely high. In order to maintain concentrations sufficient to overcome this group of infections, it is seldom necessary to employ more than 4 to 6 gm. of the drugs daily. Even in some of these conditions it may be necessary at times to administer sulfanilamide subcutaneously, but as a rule this is not necessary in this group of cases. One significant feature to be stressed in the management of these conditions is the continuation of chemotherapy until after all signs of the acute infection have subsided. As a rule it is better to discontinue the administration of sulfonamide compounds in all of these cases gradually rather than to terminate treatment abruptly. Many of the patients in this group may be ambulatory, although no rule may be employed concerning this aspect of their management except clinical judgment.

Chemotherapy in Group C.—The management of patients suffering with infections which fall into group C is somewhat more simple than the management of patients in the two groups previously described. Here the concentrations in the blood of sulfonamide compounds, either sulfanilamide, azosulfamide (neoprontosil), sulfapyridine or sulfathiazole, are relatively unimportant. For the average adult small daily doses of 2 or 3 gm. usually will produce urinary concentrations which are adequate in the treatment of these infections.

Infections Due to Green-producing Streptococci

In the infections from which may be recovered streptococci belonging to the so-called viridans group of organism, the clinician is confronted with perhaps one of his most difficult problems in chemotherapy. Fortunately, however, most of the infections due to streptococci in this group respond fairly well to either sulfanilamide or sulfapyridine, provided that the organism is not an enterococcus or Streptococcus fæcalis.

Fortunately, infections resulting from the enterococcus or Streptococcus fæcalis group are not very common. Only one case of septicemia associated with Streptococcus fæcalis has been observed in the Mayo Clinic in the past four years. Sulfathiazole is by far the drug of choice in the treatment of infections due to this organism. Negative blood cultures were obtained easily by the use of sulfathiazole in the case referred to.

Subacute Bacterial Endocarditis.—Many claims colored by therapeutic enthusiasm have been made concerning the effectiveness of chemotherapy in the treatment of subacute bacterial endocarditis. From 1934 to 1940, inclusive, 177 cases of subacute bacterial endocarditis were observed in the Mayo Clinic. Combinations of sulfanilamide, sulfapyridine and the thiazoles have been used repeatedly in different groups of these patients. The sulfonamide compounds have been given alone and in conjunction with fever therapy and with intravenously administered heparin.

One report on a selected group of these cases has been made by Krusen and Bennett. To date we cannot record a single recovery resulting from this method of treatment. There are, no doubt, a few scattered cases in which recovery has occurred, but recovery was reported before the advent of sulfonamide compounds.

The failures resulting from chemotherapy in subacute bacterial endocarditis cannot be recorded, however, because of the inability of sulfonamide compounds to inhibit most of the organisms in the group known as green-producing streptococci. The failure is purely because of the presence of a focus in direct communication with the blood stream which cannot be eradicated. Ample evidence is present to attest the effectiveness of sulfonamide compounds against most of the organisms in the green-producing streptococcus group. For example, during the period from 1937 through 1940, 75 per cent of patients who had positive blood cultures or septicemia without bacterial endocarditis recovered under adequate treatment with sulfonamide compounds (Table I). Sulfanilamide and sulfapyridine were the drugs used in all of these cases with the exception of the one case referred to in which Streptococcus fæcalis was present.

In the ordinary or mild infections of the urinary tract associated with the presence of a green-producing streptococcus, sulfanilamide or sulfapyridine usually will produce the desired results providing, of course, the foci are eradicated adequately. In the treatment of infections due to Streptococcus fæcalis, the thiazole derivatives are the drugs of choice.

Infections Due to Anaërobic Streptococci

It is generally agreed that neither sulfanilamide, sulfapyridine nor sulfathiazole is effective against infections due to anaërobic streptococci. Since most of these infections may have associated streptococci which do not belong to the anaërobic group, it seems reasonable to continue the use of these drugs, although it seems reasonably certain that they may not affect the anaërobic organisms. This treatment in itself may be enough at times to swing the balance in favor of the recovery of a patient who may be suffering with a severe infection due to a mixed group of organisms.

Local Chemotherapy in Streptococcal Infections

Sulfonamide compounds may be used locally in one of two ways in the management of streptococcal infections: (1) as prophylaxis against infection, and (2) to treat infection already existing either in superficial tissues or in body cavities.

The drugs may exert a local bacteriostatic effect or in some instances they may stimulate local tissue resistance. It seems fairly certain at any rate that the local use of sulfonamide compounds exerts a beneficial effect on the healing of infected wounds. This effect cannot be explained purely on the basis of the presence of sulfonamide compounds in the general circulation after their local application, because clinical response often has been far beyond that which might be expected from concentrations resulting from local application.

In the treatment of superficially infected wounds we have used sulfanilamide and in some instances sulfathiazole[3] in the treatment of infections associated with streptococci. Sulfapyridine has not been used. The agents may be applied in the form of a dusting powder or in the form of wet dressings which consist of sulfanilamide in saline solution. Both of these drugs have been placed directly into compound fractures. Definite beneficial results have been observed not only therapeutically but prophylactically in the treatment of infections of bone. Since sulfonamide compounds do not concentrate in osseous tissue, the higher concentration resulting from their direct implantation into these tissues is a distinct advance in the treatment of infections which occur primarily in bone. Both sulfanilamide and sulfapyridine may be used to advantage in the irrigation of empyematic cavities associated with infections due to a streptococcus.

The direct implantation of either sulfanilamide or sulfathiazole in amounts of 75 grains (5 gm.) directly into the peritoneal cavity at the time of operation for a ruptured or abscessed appendix as well as other bowel lesions has reduced markedly the mortality and morbidity rates associated with these conditions in the past two years at the Mayo Clinic. While most of these conditions are associated with other organisms in addition to streptococci, streptococci are nearly always present. Concentrations of the drugs may reach 400 to 600 mg. per 100 c.c. in the peritoneal exudate

after this procedure and the convalescence of the patient is markedly benefited. Objections have been raised by some to the use of these drugs locally, primarily on the basis of possible hepatic damage because of the possibility of high concentrations of these drugs in the portal system. This objection is without foundation in fact. All sulfonamide compounds absorbed from the intestinal tract after oral administration of doses which are far in excess of 75 grains daily must reach the liver and the general circulation through the portal system. This fact in itself would render untenable the belief that intraperitoneal implantation of 75 grains of either of these compounds is associated with any danger of hepatitis. Hepatitis with jaundice is more likely to follow suppuration and peritonitis when sulfonamide treatment is not given than when it is given.

Gramicidin Treatment of Streptococcal Infections

Since the description of gramicidin, a substance isolated from a soil bacillus by Dubos, much interest has been aroused concerning its possible use in the treatment not only of streptococcal infections but of all infections associated with Gram-positive organisms. This substance is a highly effective bacteriostatic agent for most of the Gram-positive pathogenic bacteria commonly encountered. The recent observations by Heilman and one of us (Herrell)[2] concerning the hemolytic effect of this substance render it unsafe at the present time for general use, especially where the substance may come in direct contact with the blood stream. Recently one of us (Herrell) and Heilman[5] have reported on the use of crude gramicidin (tyrothricin) in the local treatment of wounds from which streptococci as well as other Gram-positive organisms have been isolated. This substance does not appear to produce any damaging effect on the tissues. In fact, the wounds heal well after its use. This latter effect may not result from any stimulating influence of gramicidin on tissue but rather from the bacteriostatic effect of the substance against most forms of streptococci commonly encountered. The substance is in no way related to sulfonamide compounds and preliminary observations would tend to indicate that its action is entirely unlike the action of any of the sulfonamide compounds. If the hemolytic property of this interesting substance, gramicidin, can be removed and at the same time its bacteriostatic effect can be preserved, an entirely new approach may ensue in the treatment not only of streptococcal infections but of many infections associated with other Gram-positive pathogenic bacteria. At the same time chemotherapy may also be placed on a more rational basis.

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CHEMOTHERAPY IN ACUTE OTITIS MEDIA AND MASTOIDITIS*

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FOLLOWING the miraculous success of sulfanilamide in the treatment of streptococcic meningitis, chemotherapy was widely instituted in the treatment of all cases of otitic infections without due regard to the recognition of the causative organism.

The results for some time were not so impressive because little was known as to the dosage, the duration of medication and what factors should determine the continuation or discontinuation of the treatment.

During the past four years a great deal has been learned as to both the rationale of chemotherapy and its toxic effects. Although we are not altogether sure about the modus operandi of this group of drugs, nevertheless certain

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definite information has been obtained from many valuable observations.

In considering the use of sulfanilamide and its related drugs in infections of the ear and mastoid, it would seem in place to briefly consider the variations in the anatomy of the mastoid bone. Dependent upon the degree of pneumatization which has taken place, we may find the large pneumatic-celled type, the small celled type or the sclerotic type, the last of which may contain few if any cells. Any infection of the middle ear or mastoid is, therefore, greatly influenced by the structure of the bone. In the large celled variety, as stated by Williams in a recent paper not yet published, the infection travels along the mucosa of the cells and causes this mucosa to secrete so much fluid into the cells that pressure necrosis of the bony trabeculæ results. In the small celled or sclerotic type, because of the greater thickness of the submucosal tissue and its tremendous vascularization, the disease spreads by phlebitis of the veins.

The infection in the middle ear comes either by way of the lumen of the eustachian tube or along the submucosal lymphatics of the tube. For the most part it is generally agreed that the eustachian tube is the canal through which the infection travels from the nasopharynx to the middle ear.

According to Lillie's classification we have two definite clinical pathological types, the osteothrombophlebitic type and the suppurative coalescent type. In the first type, the infection spreads by infective thrombophlebitis of the small vessels of the mastoid bone and in this variety the symptoms of sepsis are apt to appear early in the disease. In the suppurative coalescent mastoiditis the infection spreads along the lining of the cells and due to pressure, necrosis of the mucous membrane and of the bony trabeculæ takes place. This type occurs for the most part in the large pneumatic mastoid and complications are less frequent than in the thrombophlebitic type.

In reviewing the literature on the effect of chemotherapy in the treatment of infections of the ear and mastoid, one can find just about the kind of a report he desires.

Lyons at the Massachusetts Eye and Ear Infirmary has shown that sulfanilamide weakens the virulence of the hemolytic streptococci and that the organisms regain their virulence on the withdrawal of the drug. His work has also shown the advantage of antibacterial antibodies when used as adjuncts to sulfanilamide therapy.

In a series of 200 cases reported at the above institution Converse found the Streptococcus hemolyticus present in eighty-three cases and in only nine instances did mastoiditis develop. Four cases are reported in which there was a recurrence of the otitis media on the withdrawal of the drug and in three other cases there was a late occurrence of meningitis in patients treated with small doses of sulfanilamide after mastoidectomy. These cases, according to the author, demonstrate that sulfanilamide therapy once instituted for good and sufficient reason should be continued until there is absolute subsidence of the infection.

On the other hand Hebble at the Children's Hospital in Philadelphia reports seventeen cases of otitis media with some clinical signs of mastoiditis where the infecting organism was the Streptococcus hemolyticus. Four patients recovered on medical treatment whereas on the other thirteen a complete mastoidectomy was performed.

In analyzing these cases there are several possible reasons for the possible failure of chemotherapy. In the first place, the initial dosage was insufficient and the therapy was discontinued too early in many instances and again some of the patients had a surgical involvement when chemotherapy was instituted.

At the University of Chicago clinics during the last three or four years the number of operations for mastoiditis has decreased markedly and this is definitely in keeping with our own observations. Lindsay in November reported ten cases of complications of otitic origin such as meningitis, abscess under the dura and petrositis. His conclusions or deductions were that chemotherapy is most successful in treating a complication which has spread by vascular routes. This corresponds to our own experiences and has been expressed by a number of authors such as Lillie, Williams and others.

Authors such as Long and Bliss feel that mastoiditis caused by the Streptococcus hemolyticus or the pneumococcus can be controlled by chemotherapy and some have gone so far as to say that surgical mastoiditis can be cured by sulfanilamide and allied preparations.

Goodyear, along with others, on the other hand, feel that otitis media due to the Streptococcus hemolyticus, when treated with sulfanilamide, will show a favorable response within four days and, if not obtained in such a time, the drug should be discontinued to avoid its masking effects.

Kopetsky claims that chemotherapy does not have the same effect on organisms located in active bony lesions.

Fenton feels that sulfanilamide may mask the clinical evidence of active infection in the mastoid until serious complications have taken place. In support of this observation we can report two cases, one of meningitis and the other of sinus thrombosis, both of which were treated for weeks with sulfanilamide and considered to be progressing nicely toward recovery.

In a series of 100 cases of scarlet fever treated by Sako, Dwan and Platou with sulfanilamide, only eight developed complications, five of which were otitis media. In 100 cases not treated with this drug, the authors found forty-one complications and seventeen of these were otitis media with four cases of mastoiditis. It does seem from this good piece of work and similar observations by a few other authors that sulfanilamide given for Streptococcus hemolyticus infections prevents, to a great extent, the development of otitis media and subsequent mastoiditis.

Williams reports a series of 265 patients with acute otitis media, 112 of whom received sulfanilamide therapy and 153 did not. Of the 112 patients, the Streptococcus hemolyticus was the offending organism in sixty, the penumococcus in sixteen and no organism was identified in thirty-six. In the 153 patients not treated, the Streptococcus hemolyticus was found in thirty-four, the pneumococcus in fifteen and no organism in 104. He concluded that there was 14.5 per cent less surgical mastoiditis in the group receiving sulfanilamide therapy over those not treated with chemotherapy and he felt that more definite protection was obtained in the group in which the causative organism belonged to the pneumococcus family.

Over a period of several years we have had a series of sixty patients with otitis media, forty of whom received chemotherapy and twenty of whom received none. Of the forty treated, nineteen showed the Streptococcus hemolyticus, five the pneumococcus and in the remaining sixteen there was no definite organism recovered. These were given large initial doses and the therapy was continued for a week after the subsidence of symptoms such as temperature, tenderness, leukocytosis, pain and edema. In the streptococcus group we did three mastoidectomies and in the pneumococcus group one operation. The group showing no organism contributed two mastoid operations.

In the untreated group of twenty cases the streptococcus was recovered in nine cases, the pneumococcus in three cases and the remaining eight cases showed no growth. In this group we had five operations, three where the streptococcus was the causative agent, one each for the pneumococcus and the no-organism groups.

In this short series, which is small compared to those made at large centers and charity hospitals, the figures show a 10 per cent statistical advantage in favor of chemotherapy.

There should be a definite procedure followed in treating a patient with purulent otitis media. At the time of the myringotomy the material obtained should be cultured and, if a Streptococcus hemolyticus or a pneumococcus is obtained, chemotherapy is definitely indicated. The patient should be hospitalized where he can be observed closely and where routine laboratory work, such as white counts, urinalyses and hemoglobins, can be done. There is sufficient evidence to indicate that chemotherapy can shorten the course of the disease and in a good number of cases prevent complications. A large initial dose of twenty-five to thirty grains should be given and then fifteen grains every four hours for three or four days. If the temperature drops and the discharge diminishes, the dosage can be cut to forty or fifty grains a day for a few days and then to twenty grains a day for a few days. It is necessary to continue the sulfanilamide for six or seven days after the subsidence of symptoms to avoid a recurrence of the infection. In pneumococcus cases smaller doses of sulfathiazol are given.

In children who are acutely ill it is our custom to give two grains of sulfathiazole per pound to be followed by a maintenance dose of one grain per pound. If the desired results are not obtained, the level of the drug in the blood should be checked, because some patients do not get

optimal level on this dosage. When sulfanilamide is indicated, one-fourth gram per kilogram body weight is given the first twenty-four hours to be followed by one-tenth gram per kilogram body weight as a maintenance dose. Along with the chemotherapy antibacterial serums are often a valuable addition.

Conclusions

Chemotheropy should be used in the treatment of otitis media and mastoiditis, but not in a haphazard manner.

It should be given after a culture has been made from the material obtained at myringotomy, in large initial doses and continued in a dosage which will maintain, if necessary, the blood level at ten to fifteen milligrams per one hundred cubic centimeters for sulfanilamide and six to eight milligrams per one hundred cubic centimeters for sulfathiazole.

The drug should not be discontinued until there is an absolute subsidence of symptoms.

Routine laboratory work should be done to detect any evidence of toxicity.

Diligent observation should be maintained to avoid optimism caused by the masking of symptoms.

Definite evidence of suppuration in the mastoid requires first the exenteration of the cells and then chemotherapy.

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OUR AGING POPULATION*

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DURING the past ten years the population of the United States has changed markedly. We are becoming a middle-aged and old-aged nation.

Many articles have been published both in lay and scientific journals reviewing this change. It is expected that this trend will continue into the future. These changes in age structure will modify the lives of the American people in many ways, socially and economically. The field of medicine will be especially affected because the type of sickness prevalent in a community, is greatly influenced by the age composition of the population.

In the past the combination of high birth rates and immigration of young people resulted in a population characterized by many young adults and a small proportion of older persons. Since the beginning of the century, the birth rate has dropped more than one-third, and there is practically no immigration. No change in birth rate can affect this trend toward advancing age in less than twenty or thirty years. If we consider sixty-five as the threshold of the old age group, 4.1 per cent of the population constituted this group. With the last census, 1940, 6.8 per cent belong to this age group. It is estimated that this number will be 14 per cent by 1980 with a total number of approximately twenty-two million over the age of sixty-five.

This condition has been brought to the public notice when the results of the 1940 census were published. This paper will be in the nature of a review of some of these articles.

The census proved what was suspected, that a lower birth rate and better medical care of infants and young adults resulted in saving a great number who reached middle age and beyond. The census figures bring out the fact that persons sixty-five years of age and over now number

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8,956,000 or 6.8 per cent of our total population; an increase of 35 per cent over the number in this age group in 1930.[1]

TABLE I. EXPECTATION OF LIFE AT BIRTH
Industrial Department, 1911 to 1940
Metropolitan Life Insurance Company

Calendar Year	Expectation in Years	Calendar Year	Expectation in Years
1940	62.93	1930	57.36
1939	62.50	1929	55.78
1938	61.94	1928	55.88
1937	60.71	1927	56.42
1936	60.31	1926	55.02
1935	60.25	1925	55.51
1934	59.45	1924	55.62
1933	59.19	1919–1920	51.14
1932	58.80	1911–1912	46.63
1931	57.90		

Gain, 1940 since 1911-1912, 16.30 years

These changes will affect our economy, our institutions, and especially the field of medicine. We must plan our medical resources in the light of trends which are unalterably upon us. In Caesar's Rome the average expectancy was twenty-five years; after our American Revolution thirty to thirty-five years; by 1900, the figure was fifty years. Today, the expectancy is nearly sixty-three years. I might add that the increase has been in middle years; that there has been no increase in longevity and the person seventy years today may not have quite as good a chance to live to over eighty, as did one of seventy years in Lincoln's time. If present tendencies continue, the population of this country will become stationary with a high percentage of people past middle-age. Unless a marked change in present tendencies occurs by 1950, the percentage of persons over sixty-four will equal the number of children under five years (7.9 per cent). By 1980, birth rate and death rate may be equal at about thirteen per thousand.

When compared to the rest of the world the United States ranks high in expectation of life at birth. In recent comparable periods, expectancy of life here has been greater than in Belgium by about three years; England and Wales by a little over one-half year; France by four and two-thirds years; Germany by over one year; Italy by almost six and a half years. Switzerland and the Union of South Africa had about the same life expectancy as the United States. On the other hand, the Scandinavian countries, New Zealand and Australia, still rank above the United States in average length of life. Although these countries make better showings as a whole, several of our states compare favorably with them. These are the central states with Minnesota in very high brackets, 65.22 years.[6]

TABLE II. PER CENT OF DISTRIBUTION OF TOTAL POPULATION BY AGE
UNITED STATES
1850 to 1950
From chart by Louis I. Dublin, Ph.D.
Metropolitan Life Insurance Company

Age	1850	1870	1890	1910	1920	1930	1940	1950
65 and over	2.6	3.0	3.9	4.3	4.7	5.4	6.3	7.9
45 – 64	9.8	11.9	13.1	14.6	16.1	17.5	20.2	21.4
20 – 44	35.1	35.4	36.9	39.1	38.4	38.3	38.8	39.7
5 – 19	37.4	35.4	33.9	30.4	29.8	29.5	26.4	23.1
Under 5 yrs.	15.1	14.3	12.7	11.6	11.0	9.5	8.3	7.9

1850 to 1930 from U. S. census data.
1940 to 1950 estimated by Thompson and Whelpton.
The percentage for age sixty-five and over has been found to be 6.8 per cent, 1940 census.

Dr. Louis I. Dublin, statistician of the Metropolitan Life Insurance Company, has made an extensive analysis of this problem.[5] He has pointed out that the proportion of elderly people in our population will increase threefold in the next fifty years if present trends continue. There will continue to be a drop in the age group below twenty years. The number of persons per one hundred of population who are in the earning and producing group of twenty to sixty-four years will stay at about the same—about fifty-six; but the ratio of the aged to the workers will change from the present six to fifty-six, upward to seventeen to fifty-six in 1980. From the economic side, an increase in pensionnaires will mean an increase in taxes. As to the present rates of Social Security taxes, let us remember what happened to the fraternal insurance companies of the last generation; rates were low after organization, low death rate, rush of new members. The companies became older, death rates increased, assessments had to be raised.

TABLE III. SOCIAL SECURITY, BUREAU LABOR STATISTICS

Means of Support of Persons Sixty-five Years of Age and Over in the United States, Compiled and Estimated, April, 1937.[2]

Economic Status	Number	Percentage Distribution
Estimated number of persons 65 and over in the United States, Jan. 1, 1937	7,816,000	100.0
Self-dependent	2,746,000	35.1
By reason of		
Current earnings	1,000,000	12.8
Savings, real estate, securities	1,172,000	15.0
Federal Pensions	104,000	1.4
State Pensions	24,000	0.3
Municipal Pensions	42,000	0.5
Private Industrial Pensions	150,000	1.9
Insurance Annuities	204,000	2.6
Other Sources	50,000	0.6
Dependent	5,070,000	64.9
Under Social Security Act, Dec., 1936	1,116,000	14.3
Emergency Unemployment Relief, Poor Relief, Old Age Assistance.	268,000	3.5
In Public Homes	67,000	0.8
Other Agencies	139,000	1.7
Dependent on Friends and Relatives	3,480,000	44.6

The Social Security Act apparently planned on a fund of 47 billion dollars by 1980. With present population trends there will be a need of near 60 billion dollars. There is reason to doubt that such a fund will ever be accumulated. The tax proceeds from this act should amount to one billion dollars a year, but the Treasury is allowed to turn this amount into an attempt to balance the Federal Budget, issuing United States bonds or buying old bonds. It is here that this act parts company with the established insurance practice. The insurance company uses its funds to buy tangible assets, from bonds of corporations to farm loans, all with earning power. The monies paid into the old age fund will have no earning power, and must become a financial strain on any government. There will be some limit to the ability of the producing classes to pay taxes, then.

Almost 65 per cent of the 8,000,000 persons in the United States who were sixty-five years or over at the beginning of 1937, were dependent. This was the conclusion reached in a study recently made by the Social Security Board, published in the March, 1938, issue of the *Social Security Bulletin*.[2]

A marked change in attitude is noted in the relatives of these old people in regard to helping them. Formerly, it was taken for granted that members of their families would assume charge of them and the public was not asked to assume the burden of their care. With new legislation and easier charity from the government there is a growing tendency for sons and daughters to avoid care or housing of indigent parents. This brings many of them into our smaller hospitals, individuals who could often be cared for at home with little effort. Such effort is not made, and a demand is made that the public assume the full burden.

It is noted that as of April, 1937, 12.8 per cent or 1,000,000 of these old people lived on current earnings. The condition of unemployment recently showed improvement with young men being called into the army. Because of the absorption of young men into the army and a greatly increased manufacturing industry, a demand is being created for older workers. May 4, 1941, was designated by the President as National Employment Sunday and the week following as National Employment week, in a proclamation of April 3, 1941. This proclamation pointed out that numerous older workers with excellent abilities and skills are still unemployed. It was also pointed out that many of these middle-aged unemployed possessed special skills which are valuable in a defense program.

Fifteen per cent of these old people of sixty-five years and over, numbering 1,172,000 as of April, 1937, are classed as self-dependent by reason of savings; these being savings accounts, real estate or securities. With present tax increases these self-dependent people will suffer loss of income. This will be more of a burden because of increased cost of living and may force some of them into the dependent group.

You will note that a considerable number of these old age groups are independent because of pensions from Veterans' Administration, Federal Employees, and Civil Service. These people are classed as self-dependent because during a period of years they have worked with the object in view of having this protection for their old age. The same may be said to be true of the state and municipal pensions. It will be expected that veterans' pensions will increase markedly in the future. Private industrial pensions were taking care of 150,000 of these old age persons

as of 1937. Some 204,000 of this group were self-dependent because of annuities. If annuities are not taxed out of existence they will continue to be a source of income for this age group.

Of the dependent groups over a million persons were receiving public assistance under the Social Security Act. This was as of December, 1936. Of course the number has increased since that time. Some 200,000 were under emergency employment, relief, old age assistance, poor relief, or other. Private homes run by denominational, fraternal and other organizations take care of many; hospitals for mental diseases 72,000. It will be noted that 3,480,000 were dependent on friends or relatives, wholly or almost wholly. This is quite as it should be and as it was in the past generation. Many of these old folks have worked and spent their money to educate and otherwise prepare their sons and daughters for life; the sons and daughters in return are paying them back and afford them protection. This, however, will become more difficult under our present mode of life; small homes, apartments and limited room.

Dr. Carl D. Camp, Ann Arbor, has urged a more careful evaluation of the medical problems of old age. While the study of infancy and its diseases has given rise to the specialty of pediatrics, the study of the involution period seems to have been neglected. An intensive study should be made of the needs of this period, diseases peculiar to the period and the modification of symptoms and course of other diseases. One cannot set a chronologic age period, for individuals differ. Between sixty and seventy most men are confronted with the problem of a possible change in their manner of life. The question of retirement, change of occupation or modification of one's work must be decided for each individual. It is at this period that the individual who has an avocation is fortunate. The man who stays on too long is not adjusting himself to his best advantage. If he feels compelled to go on in his work or profession, some modification of such work should be planned.[3] I shall not try to discuss the value to society of the physicians, lawyers and scientists who go on and do excellent work to and beyond eighty years. As a general rule one would like the man over sixty-five years to continue his occupation or interest, modified only to the extent of lessened responsibility and more fixed routine.

As a result of the increase in numbers of this group, geriatrics should approach pediatrics in importance. Studies of the aging process should be made and an effort made to improve the comfort of these old people. Cardiovascular diseases will make up an increasingly large part of the medical clientele in the future. Cancer is a problem of growing importance and while cancer rates will remain about the same, there will be growing numbers of cancer patients because of the increase of older persons in the population. There is the possibility that tuberculosis hospitals, when no longer needed for that purpose, may be used to take care of a part of the load of cancer and other chronic diseases. Respiratory diseases continue to take large numbers, but the mortality from pneumonia has dropped appreciably in recent years due to new treatment. It may be noted that modern therapy for pneumonia is not so efficient in the old as in the young.

Morbidity statistics are affected by the large increase in this group. Old age is characterized not only by a high mortality but by a high rate of disabling sickness. Acute illnesses of short duration predominate in the younger ages; in old age these are secondary in importance to chronic diseases with disability of months or years. The number of invalids per thousand increases rapidly with the years. While the average rate was eleven per thousand for all ages, the number of invalids per thousand between the ages of sixty-five and seventy-four was 53.5.

Mental diseases will be an increasing problem. Senile psychosis, cerebral arteriosclerosis, and similar conditions will overtax existing institutions.

In Crookston we have two hospitals, Bethesda Hospital and St. Vincent Hospital, with a combined capacity of just over 100 beds. On June 1, 1941, there were in these hospitals thirty patients of sixty-five years of age or over. During the month there were 203 patients admitted to these institutions of whom thirty-one were over sixty-five years. At the present time in these hospitals there are the usual run of paralytics from cerebral accidents, progressive cancer cases, senile dementia from cerebral arteriosclerosis and others with chronic arthritis and such conditions. The hospitals have found these cases a problem. During the past years in these hospitals it was noted that there was an increase in the number of admissions of older patients.

The problem is especially hard when the patient is physically disabled and mentally normal. It is not enough to just keep these individuals alive, to feed them and keep them clean. Some provision should be made for physical therapy through work, some entertainment—something to make them look beyond themselves. Being a bed-ridden or wheel chair patient will hurry on the senile changes and soon we have a depressive mental condition.

An article in *Harper's Magazine* for October, 1939, by Roy Helton, is a good example of a review of this subject in a popular lay magazine. He advocates that the aging should attempt to devise for themselves occupations at which they will also create wealth of things or services. He feels that after an individual retires and steps out of the active scenes of life, he is likely to quickly show the debilitating effects of old age. "Sudden loss of the sustaining habits and motives that have kept him in active competition for the rewards of labor, can within six months transform the busy lawyer, physician, or merchant into an aged hypochondriac." We have seen numerous examples which prove the above statement and in a rural community such as ours, I have seen many farmers and small businessmen go through this degenerating process after retiring from active life without any activity, mental or physical, to take up their time.

As preventive medicine succeeds, non-preventable diseases increase in relative importance. It would seem that preventive medicine in the younger groups has resulted in there being more sub-par older people subject to the degenerative diseases which are non-preventable. Thus, while there are more older people in the population, there appears to be no percentage increase of very old people. In other words, longevity is about what it was.[4]

An interesting phase of this problem is the increasing number of older patients who must be received as surgical cases. Many writers have expressed their interest in this problem in recent years. The urologists, of necessity, were the first to realize the ability of the aged to withstand surgery with surprising resistance General surgeons took on strangulated hernias and other emergencies. Gradually, experience has shown that old age is not the contra-indication that it was forty years ago. Reports of major operations successfully carried out in the aged are accumulating. Rankin and Johnson have reported an extensive experience in the surgical care of the aged. They emphasize prolonged and careful pre-operative care where possible, a careful examination, short period of recumbency, careful postoperative care, bodily warmth, fluids, frequent change of position and inhalations of carbon dioxid-oxygen. Respiratory complications are the most common.[7]

Without thinking about it we have continued to make plans to meet the demands of an increasing population. We have taken it for granted that we will need larger factories, farms and especially schools. Already primary schools show a falling off in attendance. This aging of our population has been appraised as the most important cultural and sociological change since the Renaissance. The change has come with startling rapidity during the present and immediately past generation. It will be more of a test to our social, political and economic institutions than was the arrival of the machine age.

Ours will be an age-conscious society in the future. This group will become better organized than the present "Dr. Townsend and Thirty dollars every Thursday" groups. They will be consumer groups rather than producers, and they will not be different from other pressure groups but will vote as a class for the clever politician who may dangle greater favors before them.

It would seem that the medical profession is facing a problem of great magnitude in the immediate future. Special study should be given to the process of aging. The effort should be made to make the lives of these old persons more pleasant and comfortable. We should give some heed to the problem of how this should be done. Do we wish to have the government take over the entire care of these old people, feeding them and giving them shelter in some sort of institution and giving them needed medical care? If not this, who will pay for their care? Is present care sufficient?

In New York City a chronic disease center has been established at Welfare Island. Here will be included a research division which will study the onset and treatment of the chronic diseases of old age. From these studies we may eventually learn what conditions are preventable or postponable. Good medical care for the aged

will require the services of a large and increasing number of physicians. The question before us will be whether these will be under Federal or State control with salaried physicians in charge.

The problem is one which the profession should consider seriously and some plan should be formulated by the profession to add to this needed care.[5] If we do not assume some leadership in this matter other social agencies will take over the care of this group.

The problem before us for the next few years will be that of a group in the productive age confronted with the problem of an extended educational period for our youth. It has been found that as a rule this period of training is from one to four years longer than was true in the past. On the other side we are having a higher percentage of old persons in the communities who will be more or less unable to care for themselves. The taxpayer meanwhile stands between the two groups, and taxpayer means all of us in one way or the other. This producer group is being asked to contribute more and more for education and more and more for the social security and old age pensions.[8]

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CLINICAL-PATHOLOGICAL CONFERENCE

MINNEAPOLIS GENERAL HOSPITAL

Frank C. Andrus, Pathologist

CHRONIC ARTHRITIS

Presentation of a Case

The case is that of a man fifty-seven years of age at the time of death who was first seen in February, 1928, when he complained of deformities of the joints of the fingers, wrists, and toes which had developed during the preceding two years. These had been accompanied by attacks of swelling, pain, local heat, and tenderness in the various joints affected. The attacks would last for a few days and then the symptoms would disappear. Finally, the patient noted that his wrist and fingers were becoming stiff and deformed. The patient's toes were so painful that he was unable to walk about. Past history at that time revealed that he had pyorrhea and dental caries for many years. He denied venereal disease.

Physical examination revealed the heart rate to be regular and no murmurs were heard. The blood pressure was 120/76. Examination of the abdomen was negative. There were marked flexion deformities of both hands and feet with some ankylosis of the joints. A diagnosis of osteo-arthritis deformans was made at that time. He was given salicylates and transferred to a rest home for four years. The patient's course there was uneventful. At no time did he have any fever. Examination of the urine revealed no abnormalities. The hemoglobin was 90 per cent.

The patient was then not seen until August, 1933, when he was again admitted for the same complaints. He now had pain and rather marked deformity in most of the joints of his body. The joints were swollen and the patient had marked interference with motion. Physical examination showed no additional findings except the marked deforming arthritis. The eyes were negative. The blood pressure was 140/90. The patient was bedridden. He was kept at the rest home for nursing care. During September, 1941, the intern noticed some peculiar lesions in the patient's eyes. In both scleræ there were a number of oval and rounded defects which were dark in color. These defects protruded as herniations from the surface of the scleræ and only a thin membrane appeared to be present over the choroid which protruded outward. The ophthalmologist made a diagnosis of scleromalacia perforans. The patient was transferred back into the hospital for study of the eye condition, where he developed an irregular fever and expired in October, 1941. Several laboratory examinations showed no abnormality in the urine. The hemoglobin was 90 per cent in 1933, 80 per cent in 1934, and 50 per cent in 1937. No other laboratory work was done.

Clinical Diagnosis: (1) Chronic rheumatoid arthritis; (2) Scleromalacia perforans; (3) Bronchopneumonia.

Autopsy Findings: The body was that of a poorly developed and emaciated man weighing about 100 pounds.

There were marked flexion contracture deformities of the hands, fingers, wrists, knees, and hips. There was edema of the feet and ankles. Cyanosis of the fingertips and mucous membranes was seen. There was no jaundice but there was a brownish discoloration of the skin of the entire body. Crusted ulcerations were seen over the upper legs and knees. There was a large decubital ulcer. The peritoneum appeared normal. The liver did not extend below the costal margin. The pericardium was adherent to the heart and the sac was obliterated. The pericardium could be stripped from the heart with difficulty. It was not adherent to the surrounding structures.

The heart weighed 350 grams and the left ventricular muscle appeared to be slightly thickened. There was thickening of some of the chorda tendinæ and of one of the leaflets of the mitral valve. The heart was otherwise normal.

The lungs were both about twice as heavy as normal. There was consolidation in the posterior portions and pus could be expressed from the bronchi.

The spleen weighed 1,475 grams (about ten times normal). It was rather firm. There were a number of calcified small nodules on the cut surface varying in size up to 4 mm. The liver was of normal weight and showed the fine type of cirrhosis.

The lymph nodes were enlarged, all of the regional nodes being affected. They appeared hyperplastic.

Anatomic Diagnosis: (1) Chronic rheumatoid arthritis; (2) Adhesive pericarditis (rheumatic); (3) Rheumatic mitral valvulitis (old); (4) Scleromalacia perforans; (5) Generalized lymphadenopathy; (6) Portal cirrhosis; (7) Felty's syndrome.

Discussion

Dr. Frank Andrus: In addition to the chronic deforming arthritis, this patient displayed several anatomic findings of interest. In the first place, he had what has come to be known as Felty's syndrome, a combination of chronic arthritis, splenomegaly, secondary anemia, generalized lymphadenopathy, and in addition, a peculiar disease of the scleræ which has been recognized to be associated with chronic arthritis. The patient had one other finding of interest and that is the evidence of old rheumatic heart disease. I am going to ask Dr. Fingerman to discuss Felty's syndrome and the relation between chronic arthritis and rheumatic heart disease.

Dr. David Fingerman: This syndrome was described by Felty in 1924. He collected 5 cases which were strikingly similar in that they all had arthritis, splenomegaly, and leukopenia. In three there was also brownish pigmentation of the skin and lymphadenopathy.

In addition, our case had a rare eye condition known as scleromalacia perforans. This consists of the appearance of holes in the scleræ which may coalesce so that large gaps develop where the uvea lies covered only by the conjunctiva or is bare. The process is considered to be a degenerative change of the scleræ. Several reports have appeared in which this condition has been noted to be associated with chronic arthritis.

Two cases of Felty's syndrome have been described in which Streptococcus viridens was isolated from blood cultures. Others have been described in which glomerulonephritis accompanied the other findings. In still others, Aschoff nodules have been found in the myocardium. In February of this year, Baggenstoss and Rosenberg studied twenty-five fatal cases of chronic infectious arthritis. All had progressive polyarticular inflammation. Twenty of these patients had associated cardiac damage, and lesions that were indistinguishable from those produced by rheumatic fever were found in fourteen. A normal heart was seen in only five cases. In ten of the fourteen patients in which there were rheumatic lesions, there was histologic evidence that the process was progressive and active at the time of death. The lesions in these consisted of valvulitis, pericarditis, and myocarditis of the diffuse and nodular types and typical Aschoff bodies were seen in some instances. In addition, more chronic changes such as thickening, hyalinization, and vascularization of the leaflets were found. In four there were no signs of activity. The valves were thickened and hyalinized and the process was interpreted as being "burned out." The heart disease was considered to be of importance in cause of death of seven of the fourteen.

These authors believe that the high incidence of rheumatic cardiac lesions in their series suggests a relationship between chronic infectious arthritis and rheumatic fever. They feel that the cardiac lesions associated with chronic infectious arthritis are not quite as severe or widespread as those lesions in hearts of young persons who have rheumatic fever; however, the differences are of degree, not of kind.

In the Minneapolis General Hospital since 1932, twenty-five cases of rheumatoid arthritis have come to necropsy including the case described above. Eleven of them had heart lesions and eight had evidence of rheumatic heart disease. Seven had mitral valve involvement and three of these also had pericarditis; two had aortic valvulitis. One had aortic valvular disease alone. Three patients had coronary sclerosis and myocardial fibrosis. In this series six patients had spleens which weighed over 300 grams, four had leukopenia, and three had the combination of lesions as described by Felty.

Dr. B. J. Clawson: This is another group in a series showing the relation between rheumatic fever and chronic arthritis. Wetherby has collected quite a number of cases in which there was heart involvement with chronic arthritis. The incidence of demonstrable heart lesions in living patients did not seem to be as high as that in acute rheumatic fever. There, I think, the age enters in. You do not usually get marked acute rheumatic involvement in later life. Those who have acute rheumatic heart disease died from it or from the resultant valvular deformity.

Dr. George Fahr: From these two series it would appear that permanent heart involvement is probably more common in cases of chronic rheumatoid arthritis than in acute rheumatic fever.

Dr. Andrus: The syndrome described by Felty probably corresponds in the adult to the Still's disease seen in children. I think that it might be regarded more as evidence of a chronic low grade sepsis rather than as a specific disease entity. If we recall the case considered today, we note that this patient, and some of the others described, had splenomegaly, portal cirrhosis, secondary anemia, and leukopenia; and the microscopic change in the spleen in this case is indistinguishable from that which we loosely classify as Banti's disease, so it might be equally justifiable to suggest that Banti's disease may accompany chronic arthritis.

There is perhaps no more neglected group of patients than those having chronic arthritis. I would like particularly to emphasize here that in this disease, even though the joints usually present the most obvious disturbance to both the patient and the physician, it must be regarded as a generalized body disease in which many tissues and organs are affected and undergo profound disturbances in structure and function.

HOMEOPATHIC AND ECLECTIC MEDICINE IN MINNESOTA

By James Eckman

Rochester, Minnesota

(Concluded from November issue)

Certain Homeopathic and Eclectic Pioneers

Dr. Julian F. DuBois,[138] secretary of the Minnesota State Board of Medical Examiners in Saint Paul, kindly furnished the author with data concerning the life and career of **Dr. Daniel Hough Roberts** (1824-1910), mentioned earlier in this paper. Mrs. J. L. Andrew of Los Angeles, California, reported to Dr. DuBois that her father, Dr. D. H. Roberts, was born in Wayne County, Indiana, on November 10, 1824. His father and mother were Quakers. Since there was no school in Wayne County during young Roberts' boyhood days, his mother taught him as best she could. Later a school was established. "The school was only three months during the winter," Mrs. Andrew wrote, "and while he plowed the field in summer he had his book in the rail fence corner and would digest a part as he plowed a furrow around the field."[138] At the age of sixteen years young Roberts entered the high school at Richmond, Indiana, and at the end of his courses was admitted to an advanced Quaker college. He then went to the Farmer's Institute at Fountain City, Indiana, but he was soon called to the chair of natural sciences at Whitewater College in Lafayette, Indiana. At length he began the study of medicine under a homeopathic physician, and became that physician's assistant. He was not graduated from a medical college. When it appeared to him that the climate of Minnesota might improve his son's health, he settled in the state. In October, 1871, he helped to found the Southern Minnesota Homœopathic Medical Society at Owatonna, and on May 14, 1872, at Rochester, he was elected vice president and treasurer of this organization.[6] He became second vice president of the Minnesota State Homœopathic Institute in 1875, first vice president in 1876, and president in 1877. He apparently was licensed to practice medicine in Minnesota by exemption.[83] Dr. Roberts went to California in 1896 for the sake of his wife's health, and at her death returned to practice in Owatonna. He later removed to California again, and died at National City on January 5, 1910, and was buried at San Diego.[138]

This chronicle may well end with the history of the careers of three Minnesota homeopathic practitioners who, although they were not essentially pioneers in homeopathic medicine, nevertheless occupied positions of such importance in the days when the homeopathic system was powerful in the state that some attention to their lives seems justified. The first of these was Dr. Henry C. Leonard. The second was Dr. William Edwin Leonard. The third was Dr. Henry C. Aldrich.

The first homeopathic practitioner to settle in Henderson was, according to Neill,[139] **Dr. Henry C. Leonard** (1849-1925). Dr. Leonard was born in the state of Virginia in 1849, but emigrated to Fillmore County in Minnesota with his parents while he was still a boy. In 1886 Dr. James G. Harper[140] wrote in the *Archives of Dentistry* of Saint Louis:

> Dr. H. C. Leonard, of Fergus Falls . . . was a fellow student of ours at the Minnesota State University. He was one of the many young men who supported themselves while attending the University; he carried a morning paper, up at 3 o'clock in the morning in that cold climate, where at times the thermometer ranged from 30° to 40° below zero.

It would appear that young Leonard's efforts at the university became too arduous for the good of his health, for it has been said that at one time while he was an undergraduate he suffered severely from eyestrain. His dogged stamina is evidenced by the fact that he walked all the way from Minneapolis to Saint Louis to be treated, returned to the university, and finished his studies. He was graduated in 1875 with the first degree of Bachelor of Civil Engineering ever granted by the University of Minnesota. Apparently, however, he had decided to become a physician, rather than an engineer, for in 1876 he was enrolled as a student at the Hahnemann Medical College and Hospital of Philadelphia. His preceptor had been the venerable William Huntington Leonard (1825-1907), and at the Philadelphia college he was a fellow student of Leonard's son, William Edwin Leonard (1855-1935).

Dr. H. C. Leonard was graduated from the Hahnemann school in March, 1878. He returned to Minnesota at once, becoming an instructor in botany at the University of Minnesota, where in 1879 he was granted the degree of Bachelor of Science. He then practiced medicine for a few months in Saint Paul, after which he settled in Henderson. In 1880 he moved to Fergus Falls, where he remained for many years.

Dr. Leonard was elected second vice president of the Minnesota State Homœopathic Institute in 1882, and in 1886 he was elevated to the presidency of that body. He also served as one of the collaborators of the old *Minnesota Medical Monthly,* second homeopathic journal to be founded in the state. He was licensed to practice medicine on December 31, 1883, by the Minnesota State Board of Medical Examiners,[141] and in 1887 Governor A. R. McGill (1840-1905) appointed him to membership on that board. He was the first professor (1888) of obstetrics in the University of Minnesota College of Homœopathic Medicine and Surgery, a position he resigned in 1891. DuBois[141] has reported that by 1903 he was in Battle Lake. At some time prior to 1905 he forsook the practice of medicine for the importunities of the farm near a place called Pine Knoll, but in 1905 he went to Duluth and resumed practice, opening his office at 416 Providence Building. In 1907 he became a member of the American Institute of Homœopathy. DuBois[141] wrote that in 1909 he was in practice at Aitkin. Dr. Leonard moved to California in 1915, and died at Santa Ana, California, in December, 1925. Two children survived him: Mrs. Joseph Marshall and Mr. Frank Leonard, Santa Ana, California.[142]

Dr. William Edwin Leonard (1855-1935), son of Dr. William Huntington Leonard, was born in Minneapolis on July 27, 1855.[86] He attended the public schools of Minneapolis and finished his preliminary education in the old preparatory school of the University of Minnesota. He was a member of the

fourth class (1876) to be graduated from the University of Minnesota, and was salutatorian of that class. He studied medicine for three years at the Hahnemann Medical College and Hospital of Philadelphia, from which he was graduated in March, 1879, with the degree of Doctor of Medicine. He spent an internship of one year at Ward's Island Homœopathic Hospital in New York City, and then returned to Minneapolis to practice medicine with his father. In 1907 he went to New York City once more, to enroll in a course at the New York Post-Graduate and Polyclinic Medical School and Hospital.

Dr. William Huntington Leonard was fifty-five years old when his son entered into practice with him in 1880. The two men were to work together for many years. Dr. W. E. Leonard had become a member of the Minnesota State Homœopathic Institute in 1879; in 1882 he became a member of the American Institute of Homœopathy. He was licensed to practice medicine in Minnesota in November of 1883, one month after his father had been licensed by virtue of the Medical Practice Act of 1883.[79] Father and son practiced together at the residence at 425 Second Avenue South in Minneapolis, which the elder man had acquired in about 1870. In 1887 they moved to an office in the Syndicate Building at 409 Nicollet Avenue.

The young man's progress in homeopathic circles in Minnesota was rapid. In 1883 he was elected treasurer of the Minnesota State Homœopathic Institute, and he was re-elected to that office in 1884 and 1885. In 1884 he was chosen secretary and treasurer of the Hahnemann Medical Society of Hennepin County, which his father had helped to found. For several years he was chairman of the all-important Bureau of Materia Medica of the state institute. In 1896 he was chairman of a committee which sought to raise funds in Minnesota for the erection of a monument to Christian Friedrich Samuel Hahnemann (1755-1843) in Washington, D. C. He was professor of materia medica and the institutes of medicine in the old Minnesota Homœopathic Medical College from the date of its foundation to the time of its merger with the University of Minnesota, and he was professor of materia medica and therapeutics in the University of Minnesota College of Homœopathic Medicine and Surgery from its formation in 1888 to its dissolution in 1908. He was editor-in-chief of the *Minnesota Medical Monthly*, second homeopathic journal to be founded in the state, throughout the two years of its existence. He served a total of twelve years (two terms) in the Minneapolis Department of Health, including a four-year tenure as senior medical inspector. In 1902 he wrote *The Healthy Woman*, a 152-page work which was issued by the Contemporary Publishing Company of New York. Dr. Leonard occupied several offices during his long career in Minneapolis, first at the family home, next in the old Syndicate Block at 409 Nicollet Avenue, next in the Andrus Building, and finally in the Donaldson Building, which for years was the headquarters of the Hennepin County Medical Society.

Dr. Leonard, one of the few earlier practitioners of homeopathy who were born in Minnesota, was keenly interested in all aspects of the history of the state. He was an active member of the Minnesota Historical Society, and at the dedication of the present building of the society in Saint Paul on May 11, 1920, he attended the ceremonies as one of the delegates from the Native Sons of Minnesota.[143]

He had been married, in 1881, to Miss Marian L. Marshall of New York

City. She died in 1905, leaving two daughters, Elsie Preston Leonard and Miriam L. Leonard. Dr. Leonard long survived his wife. The *Journal-Lancet*,[144] in October, 1929, announced: "Dr. William E. Leonard, who had practiced in Minneapolis for over fifty years, left the city last month, and went to Hadley, Mass." The aged physician, who had lived through the most salutory days of homeopathy in Minnesota, and who had remained steadfast to the tenets of homeopathy all his life, was to come back to Minneapolis to die. He died of arteriosclerosis and coronary thrombosis at 2404 Fremont Avenue South in Minneapolis on August 28, 1935, twenty-eight years after the death of his revered father.[79]

Dr. Henry C. Aldrich (1857-1922) was born to a resplendent tradition in the annals of pioneer history in Minnesota. His father was Cyrus Aldrich (1808-1871), a native of Rhode Island who had come to Minneapolis in 1855 to enter the lumber business. He served as a member of the state constitutional convention of 1857, was elected to the national House of Representatives in 1858 and 1862,[145] and was said to have been active in the establishment of the mighty Northern Pacific railway system.[36] The younger Aldrich was born in Minneapolis in 1857, and after completing his preliminary education apparently decided to become a dental surgeon. He was graduated in 1879 from the University of Pennsylvania with the degree of Doctor of Dental Surgery, but straightway enrolled in the Hahnemann Medical College and Hospital of Philadelphia. From this institution he obtained the degree of Doctor of Medicine in 1881.

Dr. Aldrich did not return to Minnesota to practice medicine. Instead, he settled in Iowa, and appears to have tired of his adopted state within a short time. In the *Minnesota Medical Monthly*[140] for October, 1886, the following announcement was published:

> FOR SALE—Practice of $2,500 in good town in Northern Iowa. Will sell house and practice for $600. Address H. C. Aldrich, M.D., Nashua, Iowa.

The same homeopathic journal observed in June, 1887: "Dr. Henry C. Aldrich, M.D., now of Nashua, Iowa, will locate in Minneapolis in August. He is now taking special instruction with certain of the Boston University† faculty."[146] Later (1896) Dr. Aldrich[147] wrote that when he was in practice in Iowa he had been a member of the Cedar Valley Homœopathic Medical Society. DuBois[79] has reported that Dr. Aldrich received a license to practice medicine in Minnesota on April 26, 1887. One year later Dr. Aldrich was admitted to membership in the American Institute of Homœopathy, with which he was to be prominently associated for the rest of his career.

Dr. Aldrich came to Minneapolis a little more than one year after the establishment of the *Minnesota Medical Monthly* and the Minnesota Homœopathic Medical College, and thus could not have taken part in the organization of these two ventures. In the summer of 1887, however, he became lecturer in pathology, histology and microscopy in the homeopathic college,[52] and in 1893 he was elected professor of diseases of the skin and venereal diseases in the University of Minnesota College of Homœopathic Medicine and Surgery, which had absorbed the Minnesota Homœopathic Medical College in 1888.[52] At the first meeting of the faculty at the University in 1893 Dr.

†The Boston University School of Medicine was organized in 1873 as a homeopathic medical college. For many years, however, it has been a "regular" institution.

Aldrich was elected clinical professor of diseases of women, a post which he resigned in January, 1894.[52]

In 1893 Dr. Aldrich was elected secretary and treasurer of the Hahnemann Medical Society of Hennepin County, and when it was decided that a homeopathic medical journal should be initiated to take the place of the foundered *Minnesota Medical Monthly,* Dr. Aldrich became editor-in-chief of the new organ. It was called the *Minneapolis Homœopathic Magazine,* and the first issue of it appeared in May, 1892. Dr. John Flanders Beaumont (1855-1927), Dr. David W. Horning (1852-1917), and Dr. Asa S. Wilcox (1859-1916) were associate editors. The publication was subsidized, as has been shown; it was published by the Minneapolis Pharmacy Company, at 604 Nicollet Avenue, "Successors to Boericke & Tafel," the great homeopathic pharmaceutical house of Philadelphia. G. A. Babendrier was business manager of the *Minneapolis Homœopathic Magazine.* While Dr. Aldrich was editor of this journal he maintained offices in the Syndicate Block at 409 Nicollet Avenue, and he lived at the Hotel St. Angelo, 1212 Nicollet Avenue. In 1905 his offices were situated at 313 Medical Block, and in 1908 they were situated at 401 Donaldson Building. For several years during the latter portion of his career he lived at 2431 Hennepin Avenue.

Dr. Aldrich persisted in his devotion to homeopathy long after it had become evident that the system of practice was fast dying out throughout the United States. DuBois[79] said that he served as president of the American Society of Orificial Surgeons, a subsidiary body of the American Institute of Homœopathy, and in 1908 he was elected president of the Obstetrical Society of the American Institute of Homœopathy.

The culmination of Dr. Aldrich's professional career was his elevation to the presidency of the American Institute of Homœopathy in June, 1915.[148] He was always a respected and even venerated speaker at sessions of the Minnesota State Homœopathic Institute, and as late as April, 1916, he was the speaker at a joint session of the homeopathic and eclectic medical associations of South Dakota at Sioux Falls.[149]

Dr. Aldrich died in Santa Monica, California, on September 28, 1922.[79] His wife and one son, Henry, survived him.

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*References 1-18 appear in the June issue, page 479; 19-37 in the July issue, page 572; 38-58 in the August issue, page 674; 59-81 in the September issue, page 769; 82-116 in the October issue, page 873; 117-137 in the November issue, page 967.

President's Letter

"THE YEAR ENDS"

SOMEONE has said that a man is not old until he lives in the past, thinks in terms of his younger years, and talks of the better ways of living when he was a boy. As his teen years begin to wane, he looks forward with enthusiasm to his life in the future. Ambition rules his ways and accomplishment regulates his days.

Similar are the thoughts of a man as he takes over the reins as president of the Minnesota State Medical Association. A full year is ahead, three hundred sixty-five days in which he hopes to complete much work and attain a goal which he sets for himself, and all of a sudden he is brought to the realization that his year has passed and then he makes an analysis of his accomplishments and all the days and nights of endeavor pass in review.

As he takes hold of the wheel at the beginning of the year and helps to drive the machine for a time, so he relinquishes it again to his successor when twelve months have passed. The basket of work which his predecessor passed to him is still full of pages to be reviewed and the torch of Minnesota medicine which he carried so proudly January first still burns only as brightly as when he first held it aloft.

The year 1941 has been one of unusual activity. Military and civilian forces have had their influence, but through it all our Association has kept its main endeavor in mind, "good health for all the people."

We are standing at the top of medical endeavor. No profession has such an influence in lay organizations as ours; our contacts with governmental groups are excellent; our legislative record is clean and within our own group only the best of feeling prevails.

Here and there a little rift has appeared at times but slight coöperative effort has stilled the troubled waters of discontent and minds have been set at ease.

Only the best of harmony is evident between the American Medical Association and ourselves. Sister State Medical Societies are friendly and the best of relations exist between their state offices and our own.

It has been my pleasure to appear before most of our county societies and to get better acquainted with our twenty-seven hundred members individually. Earnest and conscientious in their work, it is an honor to be associated in the same organization with them.

I want to thank each one for his active participation in committee work. In no mean way is the success of the organization your success.

To the incoming officers for 1942, and especially to Dr. Giffin, our incoming president, I wish every prosperity during their tenure in office. I know that the year will be filled with hard work for them, that kind of work which will raise to a new high mark, the medical influence in our state of Minnesota.

B. J. Branton, M.D., *President*

Minnesota State Medical Association

EDITORIAL

MINNESOTA MEDICINE

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BUSINESS MANAGER
J. R. BRUCE

Volume 24 DECEMBER, 1941 Number 12

MEDICAL STUDENTS AND THE RESERVE

IN our opinion there has been a good deal of unnecessary concern over the delay on the part of the medical students in the junior and senior classes in joining the Medical Reserve Corps of the army.

According to the Selective Service Act, as passed by Congress, no individuals or groups, except the clergy and divinity students, are exempt. Medical students are included in the draft with everyone else in the age groups.

The manifold increase in the size of the army has resulted in a shortage in the army medical corps. There is also a shortage in the United States Public Health Service, although there is none reported in the navy. In order to assure as large a corps of doctors as possible, the Surgeon Generals of the army and navy have put themselves on record to the effect that medical students who had reached the point of having been accepted by a medical school will not have their medical school training and year of internship interrupted as long as their scholastic standing is satisfactory. Naturally upon finishing their internship their deferment ceases and these young doctors are expected and required to do their patriotic duty by enlisting in the medical corps. If they do not enlist, and some suffer under the misapprehension that they are exempt because in the process of repeated deferment they have passed the twenty-eight year limit and are therefore exempt, they may find themselves carrying muskets.

The army is in need of more medical officers and more reserve officers and it is the desire of the Surgeon General to have the junior and senior medical students sign up in the Medical Officers Reserve. Only some 500 of the 10,000 medical students enrolled in the junior and senior classes of the medical schools of the country have so far joined. This is not necessarily a sign of gross lack of patriotism on the part of the neophytes in the profession, and the older members of the profession need not tear their hair because of the feeling that the present generation has departed from the pattern of patriotism they have set. The fact is that some of these undergraduate medical students have not felt assured that if they joined the medical reserve they would not be called until they had finished their internship. Doubtless many felt that there was no need to disturb the status quo of their relation to the draft and that signing up would naturally come upon completion of internship. Another reason why more undergraduates have not joined the reserve is that the medical schools have not, in some instances at least, made clear to the students the wishes of the Surgeon General and the fact that joining the Reserve Medical Corps will not interrupt their medical training. Doubt-

less before this statement appears in print this will have been done and many more than the 500 last reported will have signed up.

PRE-INDUCTION EXAMINATION

As was mentioned in an editorial entitled "Selective Service," which appeared in our July number, the rejection of an appreciable number (10 per cent) of selectees by the induction boards has proven a source of inconvenience and at times embarrassment to those rejected.

According to a recent bulletin issued by the Selective Service state headquarters, this source of initiation will be removed. In the future pre-induction examinations by a United States Army examining board will be given several weeks in advance to those selectees classified as 1-A and 1-AO to determine whether they are acceptable for military service. These pre-induction examinations will be given at a United States Army examination station up to thirty days prior to induction. If acceptable these men will have a period of time in which to return home and settle their affairs before entering the army.

REPORT OF COMMITTEE ON VISUAL ECONOMICS*

The Committee on Visual Economics herewith submits a revision of the report of the Committee on Compensation for Eye Injuries, which was approved by the Section on Ophthalmology and adopted by the House of Delegates on May 26, 1925. This revision is made in accordance with the recommendation of this section adopted June 13, 1940.

The principles on which the report of 1925 were based are valid and no change in these is required. However, there have been presented three principal reasons which make a revision of this report desirable. These are:

1. To eliminate a recommendation in procedure which is inconsistent with the provision of most compensation statutes for determining visual disability.
2. To supply a few omissions and to correct some minor errors.
3. To clarify some steps in determining percentage losses of muscle function.

In the report of May, 1926, a recommendation was made "that compensation statutes be so changed that awards for ocular disability shall be based on the percentage of permanent disability only," that is, on the percentage loss of both eyes. No statute has been so changed; all statutes basing percentage losses of vision primarily on the loss to one eye. This recommendation in the 1925 report is now omitted as unnecessary. By following the principles laid down in the 1925 report, compensation could be computed on the basis of percentage loss to one eye or to both eyes and now no change is found necessary to determine the percentage functional efficiency of one eye. But it is suggested in this revision that the present common statutory method be followed—that is, that the method for determining the percentage loss of vision be based on the loss of efficiency of one eye, and that disabilities involving both eyes be based on a weighted method of computation.

The following revised report is submitted for action by the section:

Compensation for Eye Injuries

(Revised 1941)

SCOPE

The aim of this report is to establish a method of determining the loss of visual efficiency of a person who has suffered any degree of impairment of vision as the result of occupational disease or injury; such method to be the basis on which the amount of compensation may be determined.

SECTION I. BASIS FOR COMPENSATION

Compensation for loss of vision should be based on that proportional part of the compensation provided by law for loss of use, or loss of function, of one or of both eyes which expresses the percentage loss of visual efficiency of the individual in pursuing a gainful occupation.

Total permanent disability of both eyes is identical with permanent total disability of the individual.

The term visual acuity as herein used should be understood to mean absolute, that is, *best acuity obtainable with ophthalmic lenses.*

Visual efficiency is defined as that degree or percentage of competence of the eye to accomplish its physiologic function.

Loss of binocular single vision is equivalent to the loss of use of one eye.

The reduction in visual acuity to 20/200 (6/60 when the metric system is used), or a reduction in visual efficiency to 20 per cent or less, is the accepted standard of industrial blindness.

When both eyes are involved in a permanent visual disability the efficiency of the coördinate function of both eyes should be determined on the basis of permanent total disability of the individual.

SECTION II. THREE PRIMARY AND COÖRDINATE FACTORS OF VISION

There are three elements of vision, each of which has an interdependent and coördinate relation to full visual efficiency. These coördinate factors are (*a*) acuteness of vision (central visual acuity), (*b*) field of vision and (*c*) muscle function. Although these

*Report of the Committee on Visual Economics of the American Medical Association reprinted at the request of the Committee on Ophthalmology of the Minnesota State Medical Association.

factors do not possess an equal degree of importance, no act of vision is perfect without the coördinate action of all.

Other functions, though secondary and dependent, are recognized as important, such as depth perception, stereoscopic vision, fusion sense, color perception, adaptation to light and dark and accommodation. These functions are inherently dependent on the status of the three coördinating functions of vision, and they also depend on central nervous function.

SECTION III. MAXIMUM AND MINIMUM LIMITS OF THE PRIMARY COÖRDINATE FACTORS OF VISION

In order to determine the various degrees of visual efficiency, (A) normal or maximum, and (B) minimum limits for each coördinate function must be established; i. e., the 100 per cent point and the 0 per cent point.

A. *Maximum Limits.*—The maximum efficiency for each of these is established by existing and accepted standards.

(*a*) Central Visual Acuity: The ability to recognize letters or characters which subtend an angle of 5 minutes, each unit part of which subtends a 1 minute angle, is accepted as standard. Therefore a 20/20 (6/6 metric) Snellen is employed as the maximum acuity of central vision, or 100 per cent acuity.

(*b*) Field Vision: A visual field having an area which extends from the point of fixation outward 85 degrees, down and out 85 degrees, down 65 degrees, down and in 50 degrees, inward 60 degrees, in and up 55 degrees, upward 45 degrees, and up and out 55 degrees is accepted as 100 per cent industrial visual field efficiency.

(*c*) Muscle Function: A maximum normal muscle function is present when binocular single vision is present in all parts of the field of binocular fixation or when there is no limitation of motion in either eye.

B. Minimum Limits.—The minimum limit, or the 0 per cent of each of the coördinate functions vision, is established at that degree of deficiency which reduces vision to a state of uselessness.

(*a*) Central Visual Acuity: The minimum limit of this function is established as the loss of light perception, light perception being qualitative vision. The practical minimum limit of quantitative visual acuity is established as the ability to distinguish form. Experience, experiment and authoritative opinion show 20/200 (6/60 metric) Snellen as 80 per cent loss of visual efficiency, 20/380 (6/116 metric) as 96 per cent loss and 20/800 (6/240 metric) as 99.9 per cent loss. The table shows the percentage loss of visual efficiency corresponding to the Snellen notations in feet for distance and in inches for near for the measurable range of quantitative visual acuity.

(*b*) Field Vision: The minimum limit for this function is established as a concentric central contraction of the visual field to 5 degrees. This degree of contraction of the visual field reduces the visual efficiency to zero.

Percentage Loss of Visual Efficiency Corresponding to Snellen Notations for Distant and for Near Vision for Measurable Range of Quantitative Visual Acuity

Snellen Notation for Distance	Snellen-Notation for Near	Percentage of Visual Efficiency	Percentage Loss of Vision
20/20	14/14	100.0	0.0
20/25	14/17.5	95.7	4.3
20/30	14/21	91.5	8.5
20/35	14/24.5	87.5	12.5
20/40	14/28	83.6	16.4
20/45	14/31.5	80.0	20.0
20/50	14/35	76.5	23.5
20/60	14/42	69.9	30.1
20/70	14/49	64.0	36.0
20/80	14/56	58.5	41.5
20/90	14/63	53.4	46.6
20/100	14/70	48.9	51.1
20/120	14/84	40.9	59.1
20/140	14/98	34.2	65.8
20/160	14/112	28.6	71.4
20/180	14/126	23.9	76.1
20/200	14/140	20.0	80.0
20/220	14/154	16.7	83.3
20/240	14/168	14.0	86.0
20/260	14/182	11.7	88.3
20/280	14/196	9.7	90.3
20/300	14/210	8.2	91.8
20/320	14/224	6.8	93.2
20/340	14/238	5.7	94.3
20/360	14/252	4.8	95.2
20/380	14/266	4.0	96.0
20/400	14/280	3.3	96.7
20/450	14/315	2.1	97.9
20/500	14/350	1.4	98.6
20/600	14/420	0.6	99.4
20/700	14/490	0.3	99.7
20/800	14/560	0.1	99.9

(*c*) Muscle Function: The minimum limit for this function is established by the presence of diplopia in all parts of the motor field, the loss of binocular single vision, or inability to rotate the eye to any point of fixation in the normal motor field. These conditions constitute zero visual efficiency.

SECTION IV. MEASUREMENT OF COÖRDINATE FACTORS AND THE COMPUTATION OF THEIR PARTIAL LOSS

A. *Central Visual Acuity.*—Visual acuity shall be measured both for distance and for near, using the Snellen notation, each eye being measured separately. Central visual acuity for distance shall be measured at a test distance of 20 feet, or 6 meters. Central visual acuity for near shall be measured at a test distance of 14 inches, or 35 centimeters.

The estimation of the visual acuity is based fundamentally on the ability to distinguish letters or characters on a standard test card at a distance of 20 feet, or 6 meters. The near visual acuity test is a means of verifying the claimant's reliability. Thus, if without reason in the judgment of the examiner the visual acuity for near is less than that admitted for distance, the distance findings should be the final expression. In certain conditions (uncorrected myopia) the visual acuity might be somewhat greater for near than for distance. In such cases the visual acuity for distance

should stand. In other cases (such as high hypermetropia or cloudy media) the near visual acuity might be less than that for distance; then proper credit should be given the claimant—the average of the distance and near determinations given as final. For example, if the visual efficiency for near is 40 per cent and that for distance is 70 per cent, the central visual efficiency for the eye in question would be $\frac{40+70}{2} = 55$ per cent.

The best central visual acuity obtainable with ophthalmic lenses shall be used in determining the degree of visual efficiency.

If there exists a difference of more than 4 diopters of spherical correction between the two eyes, brought about by injury, the best possible vision of the injured eye without glasses or with lenses of not more than 4 diopters spherical difference from the fellow eye shall be the acuity on which subsequent rating is to be computed for this injured eye.

The Snellen test letters or characters (as published by the committee and designated "Industrial Vision Test Charts") subtending a 5 minute angle, and their component parts as 1 minute angle are standard. Those test letters are to be used at an examining distance from the patient of 20 feet, or 6 meters, for distant vision and 14 inches, or 35 centimeters, for near vision. The illumination is to be not less than 10 foot candles nor more than 20 foot candles on the surface of the chart.

The table shows the visual acuity and the percentage of loss of efficiency, both for distance and for near, for partial loss between 100 per cent and zero vision for one eye.

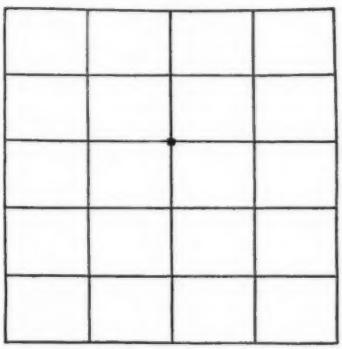
B. *Field Vision.*—The extent of the field of vision shall be determined by the use of the usual perimetric test methods, a white target being employed which subtends a one degree angle under illumination of not less than 5 foot candles, and the result plotted on an ordinary visual field chart.

The amount of radial contraction in the eight field sectors, measured in their principal meridians, shall be determined. The sum in degrees of the eight principal radii of the visual field, which normally is 500, will give the visual field efficiency of one eye in percentage when divided by 5: a 1 per cent loss is thus found for a meridianal contraction of 5 degrees for each of the eight sectors. The percentage loss may be computed thus: for example, if the field is contracted 20 degrees in all eight meridians there will be a loss of $20 \times 8 = 160$ degrees. This would amount to a loss of 160 divided by $5 = 32$ per cent field efficiency loss for the eye in question. If the field is contracted down to 5 degrees in every meridian the loss will be found to be 95 per cent. Suppose the entire temporal field is lost, the loss will amount to $65 + 85 + 85 = 235 \div 5 = 47$ per cent. If the upper inner quadrant is lost, the loss of field efficiency will amount to $55 \div 5 = 11$ per cent, and so on.

C. *Muscle Function.*—Muscle function shall be measured in all parts of the motor field, recognized methods being used for testing.

Traumatic strabismus (squint, heterotropia) may involve one or both eyes; this heterotropia is indicated by the presence of diplopia or by an inability of one or of both eyes to maintain fixation in some part of or in the entire normal motor field.

INDUSTRIAL MOTOR FIELD CHART



When diplopia is present, this shall be plotted on the motor field chart. This chart is divided into twenty rectangles 20 by 25 degrees in size, as shown in the chart. The partial loss to muscle function due to diplopia is that proportional area which shows diplopia as indicated on the plotted chart compared with the entire motor field area.

When the loss of muscle function cannot be determined by the presence of diplopia due to excessive degrees of strabismus and when it occurs in a one-eyed person, the degree of impairment must be determined by objective observation. The areas in which fixation is not possible shall be plotted on the motor field chart and the percentage loss of function computed by comparing the nonfixation areas with the entire motor field area. When there is total loss of binocular single vision, or when one eye is unable to fix on any point in the motor field, the percentage loss in visual efficiency is equivalent to the total loss and when the loss is partial the loss is proportional, based on the loss of use of one eye, provided the other eye has a normal field of fixation. Thus the loss of muscle function is rated as 5 per cent for each rectangle of the motor field in which there exists diplopia or loss of fixation.

In exceptional cases each eye may have its independent power of fixation impaired. In such cases the percentage loss of efficiency should be computed as a binocular disability as provided in section VI.

Diplopia or loss of fixation must be irremediable and based on the regulations as described in section VIII before compensation shall be awarded.

SECTION V. INDUSTRIAL VISUAL EFFICIENCY OF ONE EYE

The industrial visual efficiency of one eye is determined by obtaining the product of the computed coördinate efficiency values of central visual acuity, of field vision and of muscle function. Thus, if central visual acuity efficiency is 40 per cent, visual field efficiency is 81 per cent and the muscle function efficiency is 100 per cent, the resultant visual efficiency of the eye will be $0.40 \times 0.81 \times 1.00 = 32.4$ per cent. Should the motor efficiency be reduced 50 per cent in the example given, the visual efficiency would be $0.40 \times 0.81 \times 0.50 = 16.2$ per cent.

SECTION VI. INDUSTRIAL VISUAL EFFICIENCY OF THE COÖRDINATE FUNCTION OF BOTH EYES

It is a fact well established by common experience that visual efficiency is by no means reduced to one half (50 per cent) by the complete loss of one eye, vision in the fellow eye remaining normal; or that a permanent visual disability, total or partial, involving both eyes is not equivalent to the sum of the visual efficiency computed separately for each eye. Hence the necessity for a weighted average when a permanent binocular disability is present. The researches of the committee show that a weighing factor of 3 applied to the more efficient eye gives an efficiency rating of the individual in substantial agreement with the consensus of technical judgment, such judgment being based on actual reproduction, comparison and relative evaluation of various specific conditions of visual efficiency.

It should be noted that when an injury has involved both eyes and then this weighted principle is employed to determine the loss of visual efficiency of the individual, the factor of loss of muscle function efficiency, which is determined by the area of diplopia, should be used only in computing the efficiency of the less efficient of the two eyes. The estimation of visual efficiency of the more efficient of the two eyes is therefore based only on the efficiency computed by use of the factor of the percentage efficiency of central visual acuity and of the visual field of this more efficient eye.

The computation of efficiency of the coördinate function of both eyes follows: To the percentage figure which has been determined as the industrial visual efficiency of the less efficient of the two eyes, three times the percentage figure that has been determined similarly for the more efficient eye is added, and the result is divided by 4. The quotient will be the percentage figure that expresses the binocular visual efficiency. Thus, if efficiency rating of one injured eye is 40 per cent and that of the fellow eye is 80 per cent, the binocular visual efficiency will be found by the following formula:

$$\frac{(40 \times 1) + (80 \times 3)}{4} = \frac{280}{4} = 70 \text{ per cent;}$$

and the visual efficiency loss will be 30 per cent and compensation must be computed on the amount awarded for *total permanent disability of the individual.*

SECTION VII. TYPES OF OCULAR INJURY NOT INCLUDED IN THE DISTURBANCE OF THE COÖRDINATE FACTORS

Certain types of ocular disturbance are not included in the foregoing computations and these may result in disabilities the value of which cannot be computed by any scale as yet scientifically possible of deduction. Such are disturbances of accommodation, of color vision, of adaptation to light and dark, metamorphopsia, entropion, ectropion, lagophthalmos, epiphora, and muscle disturbances not included under diplopia. For such disabilities additional compensation shall be awarded, but in no case shall such additional award make the total compensation for loss in industrial visual efficiency greater than that provided by law for total loss of one eye when only one eye is involved and that for total permanent disability when both eyes are involved.

Compensation for loss in industrial visual efficiency, as provided for above, does not include compensation for any cosmetic defect, for mental or physical suffering, for cost of medical attention or for time lost from gainful occupation during the period of treatment previous to final computation of compensation as provided for below. Additional compensation should be awarded for the various losses here enumerated when not specifically provided for by statute.

SECTION VIII. REGULATIONS FOR COMPUTING COMPENSATION

Compensation shall not be computed until all adequate and reasonable operations and treatment known to medical science have been attempted to correct the defect. Final examination on which compensation is to be based shall not be made until at least three months shall have elapsed after all visible evidences of inflammation have disappeared, except in cases of disturbance of extrinsic ocular muscles, optic nerve atrophy, sympathetic ophthalmia and traumatic cataract; in such cases at least twelve months and preferably not more than sixteen months shall intervene before the examination shall be made on which final compensation is to be computed.

In cases of additional loss in visual efficiency when it is known that there was present a preëxisting subnormal vision, compensation shall be based on the loss incurred as a result of eye injury or occupational condition specifically responsible for the additional loss. In cases in which there exists no record or no adequate and positive evidence of preëxisting subnormal vision, it shall be assumed that the visual efficiency prior to any injury was 100 per cent.

IN FIFTY YEARS

In this country, the level of public health is the highest ever attained in the civilized world. But even that great achievement doesn't satisfy the medical men. They mean to achieve far more in the years to come. That is the way the medical mind works. It never stands still. It must always look forward.

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

ONE HUNDRED YEARS IN PICTURES

The first medical picture review ever issued, called "One Hundred Years of Medicine in Minnesota," and published under the auspices of the Committee on Public Health Education, has just come off the press.

This unique publication is timed to mark the one hundredth anniversary of the coming of Christopher Carli, first civilian practitioner of medicine to settle in Minnesota. It is designed not only as a centenary observance, but as a vivid and graphic outline for lay readers of medical progress and facilities in Minnesota.

It is told in pictures with a minimum of text because all authorities set a far higher value upon the picture technique for popular education than upon orthodox editorial matter, no matter how well written or how attractively printed.

Publication of this book was made possible by friends of medicine whose names appear on the back cover. Through their interest and assistance it has been possible to broadcast the book widely among leaders of all groups in the state. Members of the Association were to receive copies for their waiting room tables early this month.

PROCUREMENT PLANS FOR DOCTORS

Plans for the new Procurement and Assignment Service for Physicians, Dentists and Veterinarians were outlined recently by Dr. Morris Fishbein, here for the annual dinner of the Minnesota Medical Foundation, and by Dr. H. S. Diehl, dean of medical sciences at the University, who is a member of the new service board.

The new service was created November 1 by executive order of the President, at the request of Social Security Administrator Paul V. McNutt, and will function only if a national emergency places procurement of personnel on a wartime basis.

Objective will be to supply essential professional personnel for the armed forces without unnecessarily depleting services at home.

Information taken from the American Medical Association questionnaires has been put on punch cards and will be made available to the service, Dr. Diehl said, in outlining progress before health officers of the state at the Minnesota State Sanitary Conference last month. More than two-thirds of the physicians of the country responded to the questionnaire.

Many Will Remain

Future needs for reserve officers will be modified somewhat by the fact that some 60 per cent of officers already called to military duty have indicated a desire to remain beyond the 18 month period, Dr. Diehl said.

Regulations for deferment of medical students subject to draft have been changed, he pointed out further, because the amendment excusing men of 28 or more from the service will automatically release many who reach that age before they have completed internships.

To avoid that and also to safeguard the supply of physicians, all junior and senior medical students will be commissioned, upon application, in the administrative branch of the Reserve Corps while still in medical school. They will then be subject to call as soon as they have completed their internship.

Advisory Committees

For those who wish to take fellowships, a special arrangement has been made in the shape of advisory committees to function in each Military Corps Area. These committees will investigate and advise corps commanders as to the need for deferment until the fellowship is completed, in each case.

No plans have been made as yet for using these Corps Area committees for other purposes but undoubtedly they could form a useful

function in the adjustment of many other problems connected with recruiting professional service for the military forces.

It is of interest to note that Major Samuel F. Seeley, graduate of the University of Minnesota and who has already won the confidence of both doctors and military officials in Washington, has resigned his other duties to become executive director of the procurement and assignment service with headquarters in Chicago.

Efficient administration of the office and sympathetic understanding of medical problems is regarded as assured under Major Seeley's direction.

TYING UP TO DEFENSE

Recent legislative bulletins from the American Medical Association indicate that proposals for health insurance and disability benefits have been considered in connection with plans for broadening the basis of present Social Security legislation but that they are still in the formative stage and action is doubtful this year.

Late reports from Business Executive Publications, Inc., have added information to the effect that a determination has been reached, as a result of White House-Treasury-Security Board conference on Social Security, to delay for the time being consideration of a plan for disability benefits of health insurance that would be financed by further payroll taxes.

At the same time the medical association bulletin warns that broadening of the Social Security program is being pushed as part of the defense effort and social aims of the Administration are bound to be implemented, at least in part, by tying their operation into the defense program.

PREPAYMENT PLANS FOR MEDICAL SERVICE

There is no question but what there is a continuing and ever increasing interest in prepayment plans for medical service.

Doctors are talking about them in medical and staff meetings. Lay organizations such as the League of Women Voters are again debating their merits—though, unfortunately, these latter are quite likely to confuse the issue and fall back upon polemics for and against private medicine.

The truth is, hospital plans have been so successful that, to an increasing degree, they are satisfying demands even of those who have been clamoring for prepayment plans for medical service. In the minds of most medical men, also, these hospital service plans have been doing a good job.

The story is different when it is a question of insurance for medical service, and it is difficult for laymen especially to realize the complications involved. Here we are dealing with individuals and individual illnesses which challenge standardization.

No Easy Matter

If we were back in the horse and buggy days, our problem would be simpler. Then people entered hospitals only as a last resort and the armamentarium of the doctor consisted chiefly of his stethoscope and his own excellent clinical judgment. In these days of x-ray and of complicated laboratory procedures and methods of diagnosis, the problem of costs for medical service is not an easy matter to solve on any basis.

The situation is further complicated because there are no definite checks upon patients who abuse privileges or upon doctors who do not understand that there are limits to the amount of service which can be rendered for funds available.

County and state medical societies in various parts of the country have organized prepayment plans for medical service in spite of these difficulties, on the trial and error method. Most of them have found that costs of home, office and hospital service exceeded expectations and have exhausted funds.

It is easy to understand how a small percentage of both patients and doctors can use up a disproportionate amount of funds with the result that the average return to the physician becomes very small.

The result in several instances has been to abandon complete service and limit prepayment arrangements to surgical benefits while in the hospital.

Surgical Service in Michigan

In Michigan, for example, where the experiment in prepayment service has been widespread and excellently managed, complete service has not worked, for the reason that premiums have

not been sufficient to cover the costs. Prepayment plans for surgical services alone have been tried out quite extensively in some large Michigan manufacturing plants, but not enough time has elapsed as yet to report on this limited type of service.

It is clear that investigation in this untried field has only begun. Much remains to be learned before anyone can say that this plan or that plan is the method of choice. Nevertheless, organized medicine must continue to study the question.

Some facts we must face. The status of free choice which has so largely prevailed in the past is already giving way to an increasing amount of panel practice in industrial medicine and elsewhere. Free choice exists in theory only, in many branches of practice. At the same time, the public is increasingly interested in methods of sharing costs of catastrophic illness and the concept of Social Security is sure to be translated, sooner or later, into terms of medical service.

"MOST NEGLECTED OF ALL CITIZENS"

The next time you see your doctor, feel sorry for him. He is the most neglected of all citizens, though no one will deny that he is the most valuable.

He is expected to be first in the aid and comfort of the people in time of epidemic and disaster and first in caring for the sick and hurt at all times, regardless of compensation. He must be the first to answer the call of his government to war to risk his life in trying to salvage the wrecks of battle.

And in return the Government does nothing for him from an economic standpoint. The doctor is denied the benefits of Social Security and similar protections which the Government provides for most of its citizens. No regulations on wages and hours or working conditions apply to him. No provision is made for his future. The doctor is the stepchild of our national family as far as the Government is concerned.

He does not have the safeguards with which the members of nearly all other professions surround themselves. He has no union, no other organization designed for anything more than the exchange of scientific ideas, no association for mutual benefits of a material nature. If you asked a doctor why his profession does not form a sort of guild and join the CIO or the A. F. of L., and take steps to protect the interests of doctors generally, he would be so shaken at the very thought that he would have to write a prescription for his own nerves.

We can just imagine the stir an organization of that nature would create throughout the land. There would be a great outcry, indeed, if the doctors decided they needed a union to better the conditions of their profession, say with reference to hours and compensation and pensions and working conditions in hospitals and elsewhere and to regulate the amount of service they render the public free of charge and to bring about a little more promptness in the settlement of bills among patients able to pay. It would be quite a spectacle to see a committee of distinguished union doctors picketing the premises of some notorious non-payer of medical fees.

But of course you will never see such an organization. The code of the profession requires that the doctor demean himself more rigidly than the rest of us in every way. It requires that he carry on with reference only to the ethics and the dignity of his calling and with no thought of his own welfare. Still, we think it is an unfair and unreasonable situation when the butcher and the baker are raising their prices on the doctor and the Government raising his taxes and he is expected to go along on his old scale. . . .

—DAMON RUNYON, in *New York Daily Mirror*

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

J. F. Du Bois, M.D., Secretary

Minneapolis Osteopath Sentenced to Stillwater For Abortion

Re: State of Minnesota vs. William L. Sheperdson

On October 27, 1941, William L. Sheperdson, 49 years of age, a licensed osteopath, was sentenced by the Honorable Frank E. Reed, Judge of the District Court of Hennepin County, to a term of not to exceed 4 years in the State Prison at Stillwater. Sheperdson had entered a plea of guilty on September 18, 1941, to an indictment charging him with the crime of abortion. The case was referred to the Probation Officer of Hennepin County for an investigation to determine whether or not Sheperdson should be placed on probation. That investigation disclosed that Sheperdson had been drinking excessively for several years and had the following criminal record in the Municipal Court of Minneapolis:

10/31/34—Driving while drunk—case continued.
1/14/35—Drunk—$10.00 or 10 days—stayed to 1/18/35.
1/18/35—Driving while drunk—driver's license revoked—ordered to pay previous fine.
1/25-35—Driving while drunk—90 days—probation to 1/10/36.
9/25/39—Assault and battery (on wife)—45 days (served 20 days).
11/22/39—Drunk—30 days—served.
8/ 5/40—Drunk—$10.00—paid.
8/31/40—Drunk—$5.00 or 5 days.
10/24/40—Drunk—$20.00 or 20 days—paid fine.

In the present case the complaint was signed against Sheperdson by Mr. Brist on behalf of the Minnesota State Board of Medical Examiners, charging Sheperdson with the crime of abortion. Sheperdson practiced osteopathy at 315 Masonic Temple Building, Minneapolis. Along in February, 1941, he became associated with David E. Rhoades in the performing of criminal abortions. Sheperdson stated that he had performed no abortions until that time. Since February Sheperdson and Rhoades performed 15 to 20 criminal abortions, according to Rhoades' statement. According to evidence furnished the authorities, a number of these abortion cases were referred to Sheperdson by several southern Minnesota osteopaths. Rhoades, who had no license to practice any form of healing, was sentenced on October 6, 1941, to a term of not less than 2 years, and not more than life imprisonment in the State Prison at Stillwater for his part in the abortions. The long sentence given to Rhoades was due, in part, to the fact that he had 3 previous felony convictions. In sentencing Sheperdson, Judge Reed stated that the defendant was in his present difficulty because of the excessive use of liquor, and that under the circumstances, the Court could not place him on probation. Judge Reed also stated that he would not oppose the defendant's release after he had served one year of his sentence. Sheperdson's case has been called to the attention of the State Board of Osteopathy for a possible revocation of his osteopathic license.

◆ REPORTS and ANNOUNCEMENTS ◆

MEDICAL BROADCAST FOR DECEMBER

The Minnesota State Medical Association broadcasts weekly at 10:45 o'clock every Saturday morning over Station WCCO, Minneapolis, Station WLB, University of Minnesota, and KDAL, Duluth.

Speaker: William A. O'Brien, M.D., Director of Postgraduate Medical Education, Medical School, University of Minnesota.

December 6—Coronary Disease
December 13—High Blood Pressure
December 20—Rheumatic Heart Disease
December 27—Gingivitis

NINTH E. STARR JUDD LECTURE

Dr. Frederick A. Coller of Ann Arbor, Michigan, Professor and Director of the Department of Surgery at the University of Michigan Hospital, will give the ninth E. Starr Judd lecture at the University of Minnesota in the Chemistry Auditorium on Wednesday, January 21, 1942, at 8:15 p.m. The subject of Dr. Coller's lecture is "A Review of Studies on Water and Electrolyte Balance in Surgical Patients."

The late E. Starr Judd, an alumnus of the Medical School of the University of Minnesota, established this annual lectureship in surgery a few years before his death.

AMERICAN UROLOGICAL ASSOCIATION AWARD

The American Urological Association offers an annual award, not to exceed $500, for an essay (or essays) on the result of some specific clinical or laboratory research in urology. The amount of the prize is based on the merits of the work presented, and if the committee on Scientific Research deem none of the offerings worthy, no award will be made. Competitors shall be limited to residents in urology in recognized hospitals and to urologists who have been in such specific practice for not more than five years.

Essays shall be in the hands of the secretary, Dr. Clyde L. Deming, 789 Howard Avenue, New Haven, Conn., on or before April 1, 1942.

OLMSTED-HOUSTON-FILLMORE-DODGE COUNTY MEDICAL SOCIETY

Dr. P. W. Brown of Rochester was named president of the Olmsted-Houston-Fillmore-Dodge County Medical Society at the annual meeting in Rochester, November 5. Dr. J. P. Nehring of Preston was named vice president, and Dr. M. J. Anderson was reëlected secretary.

POSTGRADUATE COURSES IN OBSTETRICS

Five postgraduate courses in obstetrics, each of four weeks' duration, will be offered at the Chicago Lying-in Hospital between January 12 and June 6, 1942. These are sponsored by the Illinois State Department of Health and the Children's Bureau of the U. S. Department of Labor. The features of the program consist of observations on current managements of normal and abnormal states of the pregnant, parturient, and puerperal patient. Lectures, demonstrations, clinics, and other teaching means augment the operating room and birth room observations, and ward-round discourses. The course is run on a non-profit basis. A deposit of $25.00 is required on registration, $10.00 of which is refunded at the completion of the course. All the members of the department participate in giving the courses. Additional information and application blanks may be obtained by request from Postgraduate Course, Department of Obstetrics and Gynecology, 5648 Drexel Avenue, Chicago, Illinois.

BLUE EARTH VALLEY MEDICAL SOCIETY

The annual meeting of the Blue Earth Valley Medical Society was held November 7 in Blue Earth. Dr. Willard White of Minneapolis gave an illustrated lecture on fractures.

Officers elected were: Drs. J. J. Heimark of Fairmont, president; Dr. M. P. Virnig of Wells, vice president; and Dr. J. L. Mills of Winnebago, secretary-treasurer.

INDUSTRIAL HEALTH

Edited by the Committee on Industrial Health and Occupational Diseases
J. L. McLeod, Grand Rapids, Chairman

H. B. Allen, Austin
L. S. Arling, Minneapolis
G. L. Berdez, Duluth
T. G. Clement, Duluth
W. S. Lemon, Rochester
T. A. Lowe, South Saint Paul
R. I. Rizer, Minneapolis
S. E. Sweitzer, Minneapolis
O. H. Wangensteen, Minneapolis
A. E. Wilcox, Minneapolis

MINNESOTA'S PROGRAM

IN 1939, the Minnesota State Legislature passed an act requiring the reporting of occupational diseases and providing for the investigation and control of poisoning and disease contracted as a result of the nature of employment. The administration of this act was delegated to the State Department of Health. Early in 1940, an Industrial Hygiene Unit was organized within the Department of Health. In July of this year, the status of the Industrial Hygiene Unit was changed to that of a Division of Industrial Health.

Many of the details of the program of the newly formed division remain to be worked out with the Medical Society, representatives of organized labor and industry, the State Industrial Commission and others.

The general outline of the program is as follows:

1. To receive and investigate reports of occupational disease.

2. To promote more adequate medical services within industry; such as the employment of full-time or part-time physicians and nurses, the provision of properly equipped first aid rooms, and the maintenance of sickness records.

3. To encourage the use of ethical preëmployment and periodic physical examinations and, as a part of these examinations, the use of the routine serologic test for syphilis. It is advocated that the positive test for syphilis should not be used as a means of discrimination against an employe providing he secures adequate medical treatment, unless he has syphilis in a communicable stage, or sufficient involvement of the heart or central nervous system to be a hazard to himself or his associates.

4. To confer with industrial physicians in regard to special problems or general industrial health programs. Special urine and blood analyses for evidence of industrial intoxication will be done when warranted. Occasional physical examinations will be made as an aid in evaluating the seriousness of certain industrial exposures.

5. To provide engineering personnel who are specially trained and equipped to make studies of plant environment; such as air analysis for toxic vapors, gases, and dust, in effort to determine whether the working atmosphere is safe or otherwise and to make recommendations for the control of health hazards found. These studies will be made at the request of physicians, plant managements, the State Department of Labor and Industry, and others concerned with the health and welfare of the industrial worker.

6. To promote adult hygiene programs within industrial groups; such as the control of tuberculosis, syphilis, and other communicable or preventable diseases. This requires the coördination of other services and facilities within the Health Department.

7. To prepare and disseminate information on various toxic materials and processes, and methods for their control.

Since the onset of the National Defense Program, the Division of Industrial Health has concentrated the greater part of its effort within those industries engaged in filling defense contracts. With the rapid expansion which commonly takes place in such industries, new and unused buildings will be utilized, new processes and materials will be employed, many engineering changes will be made, and both skilled and unskilled labor will be added to the payroll. Often in such rapid expansion of activities, control measures are not kept in pace with the effort to speed up production. New materials are handled without due consideration for their potentially toxic effects. It is in the control of these processes and in the promotion of better health services within these industries that the Division of Industrial Health of this state can be of service in safeguarding the health of our industrial workers and promoting our national defense.

L. W. FOKER

In Memoriam

Franklin William S. Raiter

Franklin William S. Raiter died at his home in Cloquet, Minnesota, October 2, 1941, stricken by a cerebral hemorrhage. In 1938, he had a stroke from which he made a gradual but not complete recovery. He was in reasonably good health and attended the Minnesota State Medical meeting at Saint Paul in May, 1941. His recent cerebral accident, however, was fatal.

Franklin Raiter was born September 3, 1889, in Stillwater, Minnesota. He was the son of Frank and Elizabeth Raiter who moved to Cloquet when their children were very young.

Franklin went to school in Cloquet and graduated from the high school there. He attended the University of Minnesota and later received his medical degree from Marquette University, Milwaukee, in 1911. He entered medical practice in Cloquet in 1914.

Almost at once he entered the United States Army Medical Service and received a commission as lieutenant, later captain in the Minnesota National Guard. He was attached to this outfit on the Mexican border, and overseas in 1917 during the World War.

After being discharged, Dr. Raiter spent several months at Bellevue Hospital in New York City before returning home to resume his practice in the summer of 1919. From that time until his illness in 1938, Dr. Raiter was one of the leading physicians in his district. He kept abreast of modern developments in medicine by attending numerous clinics both in this country and during two trips to Europe.

Despite the heavy demands of his widespread practice, Dr. Raiter devoted considerable time to civic duties. For about twenty years he was a member of the school board and at the time of his illness he was its president. He served as city health officer and county coroner for approximately twenty-five years and it was a local political byword that he never had to campaign for reëlection.

He was a member of the Minnesota State Medical Association, the St. Louis County Medical Society, the American Medical Association, the American Obstetrical and Gynecological Society, the U. S. Military Surgeons' Association, the Zion Lutheran church, the Dalles lodge, the Shriners, the American Legion, the Fraternal Order of Eagles, the Odd Fellows, the Sons of Norway and the Branting lodge, Vasa Order of America. He was a charter member and past president of the Rotary Club.

He had no outstanding hobbies outside his profession. He played a little golf and went fishing occasionally. The men at the paper mill, where he worked as a boy, often found him sitting in their midst during the noon hour, visiting. He was often late to his office because he had stopped at some farmhouse to chat with old friends.

With his medical confreres he was always cheerful and cordial. He will be sadly missed by all who knew him.

Dr. Raiter is survived by his widow; one son, William; two sisters, Mrs. John Spargo and Miss Frances Raiter, Chicago, and two brothers, Dr. Roy Raiter and Roscoe Raiter, Cloquet.

—A.N.C.

Robert Graham

Dr. Robert Graham was born in Shetland, Ontario, in 1865 and died in Duluth September 22, 1941, at the age of seventy-six years.

He was graduated from the Wardsville High School and later from the Strathroy College Institute. He received his medical degree from the Wayne University College of Medicine, Detroit, Michigan, in 1893 and the same year was licensed to practice medicine in Minnesota.

He then located in Duluth but after a short time accepted a position as mine surgeon for some of the mines at Hibbing, Minnesota. A year later he returned to Duluth where he maintained his offices until shortly before his death. He was a member of the St. Louis County Medical Society, Minnesota State Medical Association and the American Medical Association.

Soon after establishing himself in Duluth he married Miss Augusta Oppel, a member of one of Duluth's early families. She and two daughters, Mrs. Norman Seiter of Utica, N. Y. and Mrs. Herbert Bartholdi of Saint Paul, survive him.

Dr. Graham stood high in Elkdom and in Masonry. He had taken the Scottish Rite degrees and was an Aad Temple Shriner. Early in his medical career he was appointed county physician to St. Louis County. He performed the duties of this office creditably and well for many years, until the infirmities of advancing age caused him to resign the office. He took several postgraduate courses in his earlier years, endeavoring ever to seek inspiration and keep himself abreast of the times. He was a past president of St. Louis County Medical Society and had served as Chief of Staff of St. Lukes Hospital in Duluth. He had taken a very active and influential part in the affairs of the hospital during all his years in Duluth. As the years slipped by and his work increased he chose to limit it to surgery only. During many years he was looked upon as one of Duluth's leading surgeons.

He had been very active in the organization of the Duluth Automobile Club and the furtherance of its good work. Its value to the community was in no small degree due to his influential efforts.

Robert Graham was a doctor of the old school. His interest in his patients was always friendly. He was kindly, patient and possessed of a spirit of tolerance to an unusual degree. His homely comparisons, nearly always tinged with humor, characterized the man's attitude toward life better than anything else excepting his work itself to which he brought a high sense of fidelity to duty.

S.H.B., Sr.

PROCEEDINGS of the MINNESOTA ACADEMY OF MEDICINE

Meeting of October 8, 1941

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, October 8, 1941. Dinner was served at 7 o'clock and the meeting was called to order at 8 p.m. by the president, Dr. J. M. Armstrong.

There were fifty-four members present.

Minutes of the May meeting were read and approved.

The scientific program followed.

SOME PROBLEMS IN AVIATION MEDICINE

Maurice B. Visscher, M.D.

Dr. Visscher, of the Department of Physiology, University of Minnesota, read his Inaugural Thesis on the above subject. Lantern slides and charts were shown.

Summary

The aspects of aviation medicine which give it a distinct character arise from the behavior of the human organism in adjusting itself in new and different environmental situations. Consequently, by definition the peculiar problems of aviation medicine are physiological ones. The unusual environmental situations to which the human body is exposed in aviation may be divided into four general categories. They are: (1) altered total atmospheric pressure; (2) altered oxygen tension; (3) accelerational forces; and (4) variable situation in space. Rapidly decreasing total atmospheric pressure sets up the conditions for decompression disease. Symptoms comparable to those found in caisson disease occur in aviators. They are presumably due to bubble formation in the blood and tissue. The mechanism by which bubbles, which are new phases, are formed in fluids when the pressure over them is reduced is still obscure. Different individuals show varying degrees of severity of symptoms during decompression. The tolerance of the body to lowered oxygen tension is critical in relation to the altitude at which human flight is possible. Again, there are individual differences in susceptibility. The discovery of means for raising the altitude ceiling of aviators constitutes one of the most important problems in aviation medicine. Results of experiments were presented indicating that various chemical agents influence susceptibility to the effects of oxygen want. The accelerational forces to which the body is exposed in flying maneuvers is very much greater than those to which a human body is subjected under other conditions of life. The magnitude, the direction and the duration of application of accelerational forces are all important to the effect produced. Applied forces of a certain intensity and duration have greater effects if the action is in the long axis of the body than they have if they are applied in the direction of shorter axes. In practice, it has been found that the assumption of a crouching position during turns gives considerable protection to aviators. Postural reflexes having their origin in end organs in the vestibular apparatus lead to erroneous and undesirable responses in pilots. Visual and deep pressure sensations provide, in general, reliable information. A large number of physiological problems in connection with the behavior of the human body in flight still await satisfactory solution. Progress in aviation practice today depends at least as much upon equipping flying personnel so that they are capable of utilizing the capacity of the modern airplane as upon any other factors. Airplane motors can operate at higher altitudes than the human can tolerate. Airplane bodies are structurally able to bear greater accelerational stress, than can the human body. Air craft can ascend at greater rates than can be tolerated by the occupants of the plane unless they are specially prepared. There is an obvious place for fruitful physiological investigation in the attempt to solve these practical problems.

Discussion

Dr. Max Alberts, Saint Paul: I have enjoyed Dr. Visscher's paper a great deal and wish to compliment him on his fine presentation of this most interesting subject. I would like to ask him if there has been any experimental work done on the so-called anticipation of direction, which I believe can be explained on some personal experience and observation. Some twenty years ago I had an opportunity to do considerable flying, and at that time so-called stunt flying in its various phases was quite a popular pastime. It was my observation that the passenger after going through various maneuvers often became very nauseated, frequently followed by vomiting, and in some cases loss of consciousness results, while the pilot suffered no reactions whatsoever. However, when the situation was reversed and the pilot acted as a passenger, very often the same reactions were experienced by him. In other words, the pilot, knowing exactly what was to transpire during the maneuver, could adjust himself accordingly—he "rode the plane" instead of fighting the change of direction. This would seem to me a rather important factor both in large military planes which carry several in the crew and even the large transport planes used in civilian aviation, although I realize that the type of flying is entirely different from that experienced in the small combat planes.

Dr. Visscher, (in closing): I am sure that is correct. I think there is probably a relatively simple explanation, and that is the posture assumed by the person who is expecting this thing. The pilot is able to assume a more desirable posture, knowing what is going to happen.

I know there is work going on in one or two American laboratories, such as you mention. We have only two centrifuges in this country as compared with 8 or 10 in Germany. Very little experimental work can be done right in the planes because they can't carry the equipment necessary. The place to do it is probably in centrifuges. I wish I could go into the point you mention with more assurance. I can't tell you what has been done because I haven't gone over all the literature.

The meeting adjourned.

E. V. Kenefick, M.D.
Secretary.

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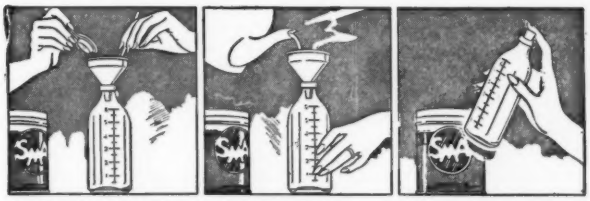

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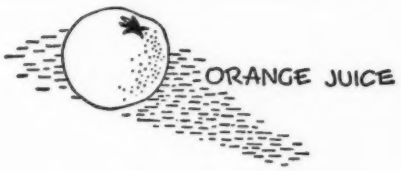

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OF GENERAL INTEREST

Dr. William Rademaker of Detroit Lakes has become associated with the Shipman Hospital in Ely.

* * *

Construction of a 42-foot addition to the Hart Hospital in Monticello has been begun by Dr. W. E. Hart.

* * *

Dr. Cyril Smith of Duluth has been appointed a member of the Minnesota Boxing Commission, his term to run until January, 1943.

* * *

Dr. Donald W. Johnson of Fairmont is announced as the first prize winner in the photography division of the 1941 American Physicians' Art Association contest.

* * *

Dr. C. L. Oppegaard of Crookston gave an illustrated talk on surgical technique at the fall meeting of the Red River Valley Medical Society held at Warren, Minnesota, October 28.

* * *

Dr. and Mrs. W. C. Stillwell, Mankato, Minnesota, were in Boston, November 3 to November 8, where Dr. Stillwell attended the American College of Surgeons meeting.

* * *

Dr. Robert Gray, who has been associated with the Marshall Clinic at Marshall, has joined the "Medical Aid to Britain" division of the American Red Cross and has gone to England for active service.

* * *

Dr. W. L. Herbert, who has practiced in Granite Falls for the past ten years, has moved to Minneapolis where he has opened offices at 307 East Hennepin for the practice of general medicine and surgery.

* * *

Dr. G. C. Strauss has become associated with Dr. Robert Bray at the Biwabik Hospital in Biwabik. Dr. Strauss interned at St. Luke's hospital in Duluth, and since July had practiced at Grand Marais.

* * *

Dr. Reynold A. Jensen, assistant director of the Psychiatric Clinic for Children at the University of Minnesota, addressed the South Dakota Public Health Nurses Association at Mitchell, November 14. His subject was "Psychiatry and the Public Health Nurses."

* * *

Dr. Charles W. Rogers has purchased the Southwestern Minnesota Hospital in Heron Lake from Dr. Alfred G. Chadbourn, with whom he has been associated since March, 1938. Dr. Rogers is a graduate of the University of Minnesota Medical School, Class of 1935, and served his internship in St. Mary's hospital in Duluth.

* * *

Dr. Reino H. Puumala of Cloquet recently was named coroner for Carlton County, filling the vacancy caused by the death of Dr. F. W. S. Raiter, who had served in that capacity for twenty-five years.

The Masonic lodge of Caledonia honored Dr. and Mrs. De Costa Rhines, who recently moved from Caledonia to Owatonna, at a reception, October 30. Dr. Rhines practiced in Houston County for many years.

* * *

Dr. Benjamin F. Swezey has reopened offices in Buffalo after an absence of four years. Dr. and Mrs. Swezey left Buffalo to go to Iowa and later they moved to Bellingham, where Dr. Swezey was in practice for some time.

* * *

Dr. Russell M. Wilder of Rochester was one of a group of alumni distinguished for outstanding activity in a special field, who was awarded a medal by the University of Chicago at the recent celebration of its fiftieth anniversary.

* * *

Dr. D. C. Balfour of Rochester has been appointed an honorary consultant to the Medical Department of the United States Navy. The appointment was made upon the recommendation of the Secretary of the Navy to the President.

* * *

Dr. Theodore C. Erickson, a graduate of the University of Minnesota Medical School in 1930, has been appointed associate professor of surgery at the University of Wisconsin. A native of Saint Paul, Dr. Erickson has been staff surgeon at the Montreal Neurological Institute in Montreal.

* * *

Dr. E. M. Hammes of Saint Paul was elected president of the Central Neuropsychiatric Association at its meeting in Detroit and Ann Arbor, Michigan, the latter part of October. Dr. William Smith of Indianapolis was named vice president, and William Menninger of Topeka, secretary-treasurer.

* * *

Dr. Waltman Walters of Rochester lectured at the Klahr Auditorium in Philadelphia, November 18, under the Constantine Hering Fund of the Hahnemann Medical College and Hospital of Philadelphia. His subject was "Malignant Lesions of the Stomach." Dr. Walters was honored at a dinner preceding the lecture.

Dr. Walters has been named a member of the National Advisory Cancer Council, succeeding Dr. James B. Murphy of the Rockefeller Institute.

* * *

Trustees of the Minnesota Medical Foundation were reëlected at the annual dinner in the Coffman Memorial Union, November 7. They are Drs. Erling S. Platou and Robert L. Wilder of Minneapolis and Dr. George A. Earl of Saint Paul.

Dr. Morris Fishbein of Chicago, editor of the *Journal of the American Medical Association,* spoke.

The Foundation's bulletin appeared in November in a new form under the title of "Trends in Medical Practice and Research."

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1. Knight, F., and Shelanski, H. A., "Treatment of Acute Anterior Urethritis with Silver Picrate," Am. J. Syph., Gon. & Ven. Dis., 23, 201 (March), 1939.

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Among speakers at the Post-Graduate Medical Assembly of South Texas, which presented its tenth annual clinical meeting December 4 in Houston, was Dr. William C. MacCarty of Rochester.

* * *

Dr. Peter D. Ward, medical superintendent of Charles T. Miller Hospital in Saint Paul, has been named a member of the permanent Hospital Service Commission of the American Hospital Association which was established during the recent annual meeting of the association.

* * *

Recently relieved from extended active duty with the United States Army were: Dr. Bruce M. Anderson of Rochester and Dr. George J. Halladay of Brainerd. Both are first lieutenants, and were assigned to Camp J. T. Robinson, Arkansas.

Orders of Dr. Nesmith P. Nelson of Brainerd, captain, to report for active duty, have been revoked.

* * *

Dr. Paul W. Searles, a former fellow in anesthesia in the Mayo Foundation, has been appointed professor of anesthesia and head of that department in the School of Medicine at the University of Buffalo. Dr. Searles received the degree of Master of Science in anesthesia from the University of Minnesota while at the Mayo Clinic.

* * *

Dr. P. N. Pastore of Rochester has received the appointment of professor of otolaryngology and rhinology at the Medical College of Virginia in Richmond. The appointment becomes effective January 1, 1942.

Dr. Pastore is a member of Sigma Xi and has been certified by the American Board of Laryngology. He received the degree of M.S. in Otolaryngology and Rhinology from the University of Minnesota while at the Mayo Clinic.

* * *

Dr. Donald C. Balfour, of Rochester, director of the Mayo Foundation, received an honorary doctor of laws degree at a special convocation at the University of Toronto, Canada, his alma mater, October 24. Dr. Balfour received his M.B. degree there in 1906 and his M.D. degree in 1914.

The honorary LL.D. degree is Dr. Balfour's second, the first being awarded by Carleton College, Northfield, in 1934. Last May he was awarded an honorary degree of Doctor of Science by McMaster University in Hamilton, Ontario.

* * *

Dr. Owen H. Wangensteen, head of the department of surgery at the University of Minnesota Hospitals, is chairman of the Forum on Fundamental Surgical Problems which held its first meeting at the Clinical Congress of the American College of Surgeons in Boston, November 4 to 7.

Papers presented were by a number of Minnesota men: Dr. Arnold J. Kremen, Dr. Wangensteen, Dr. N. Kenneth Jensen, Dr. Richard L. Varco, Dr. N. Logan Leven, Dr. Clarence Dennis, Dr. John R. Paine, Dr. Charles F. Code, Dr. Lyle J. Hay and Dr. Bernard Lannin of the University of Minnesota medical school.

Also Drs. A. E. Osterberg, S. B. Harper, Asher S. Chapman, James T. Priestley and W. R. Lovelace of Rochester.

* * *

The annual dinner meeting of the general medical faculty of the University of Minnesota was held November 6 in the Coffman Memorial Union.

Dr. Wallace H. Cole, who recently returned from England, spoke on his experiences as director of the American Hospital in Britain, and Dean Theodore C. Blegen of the Graduate School, discussed "Glimpses of Northwest Medical History."

Dr C. D. Creevy, assistant dean of the Medical School, presided in the absence of Dr. Diehl. A special guest at the dinner included the president of the university, Walter C. Coffey.

* * *

Dr. Walfred Johnson, who has been in practice in Sauk Center since 1926, has gone to Chatham, Massachusetts, to assume the practice of a physician called into active service of the U. S. Marine Corps. Chatham is near Dr. Johnson's home town of Worcester.

Taking over Dr. Johnson's practice during his absence is Dr. Karl Pleissner of Minneapolis, a graduate of the University of Minnesota Medical School.

Dr. Johnson, who plans to be away from Sauk Center for just a year, purchased the practice of the late Dr. E. J. Lewis, father of the famous novelist, Sinclair Lewis, in 1926.

* * *

Governor Stassen has appointed as a member of the Minnesota Committee of the White House Conference on Children in a Democracy, Dr. R. L. J. Kennedy of Rochester. Dr. John Anderson, director of the child welfare institute at the University of Minnesota, has been named chairman of the committee.

Dr. Henry R. Helmholz, Rochester pediatrician, is a member of the National Citizens' committee and will serve as liaison officer between that community and the Minnesota group, which will act as the child welfare section of the Minnesota welfare defense advisory committee.

* * *

Dr. John L. Rothrock of Saint Paul has given a gift of $50,000 to Gettysburg College in Gettysburg, Pennsylvania, from which he received his B.A. degree in 1885.

Dr. Rothrock, who took his medical work at the University of Pennsylvania, practiced in Saint Paul from 1890 to 1936 when he retired from active practice. He was made professor emeritus of obstetrics and gynecology at the University of Minnesota Medical School in 1936, having served on the medical faculty since 1895.

Dr. Rothrock received a Doctor of Science degree from Gettysburg in 1934.

* * *

Dr. W. Randolph Lovelace of Rochester is the newly elected president of the Aero Medical Association of the United States. He was named to that office at the association's annual meeting in Boston, October 31-November 2.

Dr. Lovelace, co-winner with Dr. Walter Boothby of

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recognition in the award of the Collier aviation trophy last year, is one of the youngest men ever to head the association.

Drs. Lovelace, Boothby, J. H. Tillisch, H. C. Hinshaw, together with Dr. Arthur Bulbulian (dentist), of the Mayo Clinic presented papers at the meeting.

* * *

A bronze statue of the late Drs. William J. and Charles H. Mayo in their surgical gowns will be the central point of interest of the Mayo Memorial Shrine to be erected in Rochester by residents of Rochester and Olmsted County.

The shrine, which was designed by James Earle Fraser, New York sculptor, will be separate and distinct from that being planned by the Minnesota Memorial Commission headed by Senator William B. Richardson.

The bronze statue will be placed on a granite base before a granite background in the central open space of an amphitheatre, symbolic of operating rooms.

* * *

Approximately fifty persons registered for the course of lectures, demonstrations and clinics concerned with problems related to medical and surgical emergencies in civilian and military practice, given at Rochester the week of November 10, under the direction of the Mayo Foundation.

Among the lecturers was Sir John Boyd Orr of London, scientific adviser to the minister of nutrition of Great Britain, who spoke on "The Rôle of Nutrition in War and Peace," and Dr. Wallace H. Cole of Saint Paul, who discussed his experiences in orthopedic surgery in England.

The scientific and clinical programs were presented by staff members.

* * *

The American College of Surgeons at its meeting in Boston last month announced the addition of sixteen more hospitals to its 1940 list of 200 approved for training in surgery.

This addition will provide training for fifty-six more graduate students in surgery, bringing the total locations to 697. The present appointments exceed the number of men available to fill them, 101 vacancies already existing on the resident staffs in surgery at the approved hospitals. It is questionable whether the present emergency should be allowed to interfere with the training of qualified surgeons.

The Minnesota hospitals approved by the college are: Minneapolis General, University Hospitals, Mayo Foundation, Ancker, Miller and Gillette Hospitals.

* * *

Former fellows in the Mayo Foundation, who majored in pediatrics and were associated with Dr. Samuel Amberg of Rochester, honored him at a surprise dinner, October 31.

There were sixty guests, including a large number of former residents who were in Rochester for the annual meeting of the Alumni Association of the Mayo Foundation.

Dr. Amberg was presented with a book compiled by his former associates and consisting of contributions

written by them. To the pediatrics department at the Mayo Clinic went an etching of Dr. Amberg, the portrait also a gift of the former residents.

Dr. R. L. J. Kennedy was master of ceremonies.

Dr. Amberg, who is associate professor of pediatrics in the Mayo Foundation, has been associated with the Mayo Clinic since 1921.

* * *

Dr. William H. Long of Fargo, North Dakota, was elected president of the Alumni Association of the Mayo Foundation for Medical Education and Research, which held its twenty-third annual reunion in Rochester, October 29-31. Dr. Long succeeds Dr. Porter P. Vinson of Richmond, Virginia.

Other officers named are: Dr. J. M. Blackford, Seattle, Washington, first vice president; Dr. T. J. Kinsella of Minneapolis, second vice president. Dr. E. L. Meland of Minneapolis was reëlected secretary, and Dr. D. Morrison Masson of Rochester, associate secretary and treasurer.

Dr. C. F. Dixon of Rochester was elected to the board of governors.

Approximately 140 visitors registered for the three-day session.

* * *

Medical reserve officers called to active duty with the United States Army within the past few weeks include:

Stanley S. Chunn, Pipestone, first lieutenant, Corps Area Service Command Station Hospital, Fort Leavenworth, Kansas.
William Ginsberg, Saint Paul, major, Anti-aircraft Training Center, Camp Hulen, Texas.
Robert Fred Golden, Rochester, captain, Corps Area Service Command Station, Camp J. T. Robinson, Arkansas.
Carl Alfred Hanson, Minneapolis, first lieutenant, Corps Area Service Command Station Hospital, Fort Snelling, Minnesota.
Homer H. Hedemark, Thief River Falls, captain, to Fort Leonard Wood, Missouri.
Linneus Godfrey Idstrom, Ah-gwah-ching, first lieutenant, to Fort Snelling.
Donald Everett Ralston, Minneapolis, first lieutenant, Fort Snelling.
Bernard Selinger, Red Lake, first lieutenant, 368th Infantry, Fort Huachuca, Arizona.
Carl Oliver Thompson, Hendricks, first lieutenant, Corps Area Service Command Station Hospital, Fort F. E. Warren, Wyoming.
John Gordon Griffin, Rochester, first lieutenant.
Leonard Wood Moody, Ah-gwah-ching, first lieutenant.
Earl V. Wetzel, Jr., Little Falls, first lieutenant.

* * *

Dr. Harold S. Diehl, dean of medical science at the University of Minnesota, has been named a member of the five-man board of the Procurement and Assignment Service for Physicians, Dentists and Veterinarians, which was established in the Office of Defense, Health and Welfare Service on executive orders. Dr. Diehl attended the organization meeting in Washington, D. C., November 6.

Among members of sub-committees, which will function under this Service, are the following University of Minnesota faculty members: Dr. Gaylord W. Anderson, a member of the sub-committee on public health; Dr. Ruth E. Boynton, sub-committee of women physicians in the defense program.

The functions of the new service include procurement of personnel for emergency needs, and the needs of medical service for civilian defense and other civilian needs.

In addition to this post, Dr. Diehl is a member of the Committee on Preparedness of the Association of

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American Medical Colleges. He is also a member of the executive council of that organization.

* * *

Faced with a critical need for physicians to serve as Associate Medical Officers in the federal civil service in such agencies as the Veterans Administration, the United States Public Health Service, the Indian Service, and others, the civil service commission is announcing a new medical officer examination.

The examination covers three grades: Associate Medical Officer, $3,200 a year; Medical Officer, $3,800 a year, and Senior Medical Officer, $4,600 a year. Applicants for the Medical Officer grade must have graduated from a medical school (Class A) since May 1, 1920, and for the Associate grade, since May 1, 1930. No specified time limit is set for graduation for the Senior grade.

No written test is required. Applicants are rated upon their education and experience. Senior Medical Officers must have had professional experience in one of the following: Aviation medicine; cardiology; and public health (general). Qualifying optional branches for the Medical Officer and Associate Medical Officers include: Aviation medicine; cardiology; dermatology; eye, ear, nose, and throat (singly or combined); general practice; industrial medicine; internal medicine and diagnosis; medical pharmacology; neuropsychiatry; pathology, bacteriology, and roentgenology (single or combined); public health; surgery; tuberculosis; urology; and cancer. The maximum age limit for all grades has been raised to *fifty-three*.

Because of the demand, persons who can qualify for the Associate Medical Officer grade, are urged to apply. Applicants for this grade need not have had experience other than one year of internship, general rotating, or in an optional branch. For this grade, applications will be accepted from persons who are now serving but who have not yet completed internship; but they must complete their internship before entering on duty.

Announcements and application forms may be obtained at any first- or second-class post office, or from the Civil Service Commission, Washington, D. C.

* * *

Dr. Louis Blanchard Wilson, director emeritus of the Mayo Foundation, was honored by the Mayo Foundation chapter of Sigma Xi, November 8, at a dinner in Rochester which 115 persons attended. Dr. Wilson was national president of the fraternity in 1932 and president of the Mayo Foundation chapter in 1924.

Two speakers came from out-of-town to cite Dr. Wilson's work. They were Dr. Albert J. Chesley of Saint Paul, secretary of the Minnesota State Public Health Department, who told of Dr. Wilson's activities in public health work; Colonel George Callender of Washington, D. C., who told of his study on the effect of gunshot wounds.

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Other of Dr. Wilson's achievements were recounted by Dr. Edgar V. Allen, who extolled his work in the Sigma Xi organization; Dr. Donald C. Balfour, director of the Mayo Foundation, who related his attainments in medical education and research; Dr. William C. MacCarthy, whose subject was "Dr. Wilson in the Clinic Laboratories"; Dr. A. H. Sanford, who spoke of Dr. Wilson's activities in arts and crafts; Dr. A. C. Broders, who cited his interest in hunting; and Dr. L. W. Pollock, who pictured Dr. Wilson as a horticulturist.

* * *

A new teaching program for junior and senior classes in the University of Minnesota Medical School will be inaugurated next fall.

The most revolutionary change made in the curriculum for years, the new plan abolishes the quarter system (90-day quarters), and instead divides the junior and senior years into five periods of 73 days each.

Four divisions of the class will be in school for each fifth of the year, while the fifth division will be on vacation.

Four clerkships are set up for the junior year, one for each division in attendance. These are primarily in-patient clerkships and will be in general medicine, surgery, pediatrics and neuropsychiatry. They will extend through 73 days, and divisions will rotate until each will have completed all four clerkships by the end of the junior year.

In the senior year, the students will spend a fifth on the Obstetrics-Gynecological clerkship, and the other three-fifths in a rotation through the various out-patient clinics.

The didactic work missed in the junior year by a division on vacation will be made up by shifting the vacation period in the senior year, so that it will be in a different fifth from that in the junior year, and having the seniors attend junior didactic classes during that corresponding period. Similarly, the junior divisions each will anticipate the senior vacation by attending the senior classes during the fifth corresponding to that in which they will be out of school the following year.

The curriculum, in general, for the junior year will include: whole-class exercises in pediatrics, internal medicine, general surgery, neuropsychiatry, radiology, pharmacology and orthopedics; and in-patient clerkships in general medicine, general surgery, pediatrics, neuropsychiatry.

The curriculum for the senior work will include: whole-class exercises in dermatology, obstetrics and gynecology, ophthalmology, otolaryngology, urology and orientation to practice. Clinical work will consist of in-patient and out-patient clerkship in obstetrics and gynecology, and out-patient work in all departments.

All departmental theses will be discontinued, and instead seniors will be required to present before graduation one comprehensive thesis, on which they will work during their junior and senior years.

This new teaching plan has been worked out by Dr. J. C. McKinley and Dr. Irvine McQuarrie, and

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FRACTURES & TRAUMATIC SURGERY—Two Weeks' Intensive Course will be offered four times during the year 1942, dates to be announced. Informal Course available every week.
GYNECOLOGY—Two Weeks' Intensive Course will be offered four times during the year 1942, dates to be announced. Clinical and Diagnostic Courses every week.
OBSTETRICS—Two Weeks' Intensive Course will be offered twice during the year 1942, dates to be announced. Informal Course every week.
OTOLARYNGOLOGY—Two Weeks' Intensive Course will be offered twice during the year 1942, dates to be announced. Clinical and Special Courses starting every week.
OPHTHALMOLOGY—Two Weeks' Intensive Course will be offered twice during the year 1942, dates to be announced. Informal Course every week.
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BOOK REVIEWS

Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

BOOKS RECEIVED FOR REVIEW

THE ESSENTIALS OF OCCUPATIONAL DISEASES. Jewett V. Reed, B.S., M.D., F.A.C.S., and A. K. Harcourt, B.S., M.D., Indianapolis, Ind. 225 pages. Price, $4.50, cloth. Springfield, Ill.: Charles C. Thomas, 1941.

CANCER OF THE FACE AND MOUTH. Diagnosis, Treatment, Surgical Repair. Vilray P. Blair, M.D., Sherwood Moore, M.D., and Louis T. Byars, M.D. 599 pages. Illus. Price, $10.00, cloth. St. Louis: C. V. Mosby Co., 1941.

INFANT NUTRITION. A Textbook of Infant Feeding for Students and Practitioners of Medicine. Third Edition. Williams McKim Marriott, B.S., M.D. Late Professor of Pediatrics, Washington University School of Medicine; Physician-in-Chief, St. Louis Childrens Hospital. Revised by P. C. Jeans, A.B., M.D. Professor of Pediatrics, College of Medicine, State University of Iowa. 475 pages. Illus. Price, $5.50, cloth. St. Louis: C. V. Mosby Co., 1941.

THE MODERN TREATMENT OF SYPHILIS. Second Edition. Joseph Earle Moore, M.D. Associate Professor of Medicine, Johns Hopkins University, Physician-in-Charge Syphilis Division of Medical Clinic and

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1941 YEAR BOOK OF GENERAL MEDICINE. Edited by George F. Dick, M.D., et al. 848 pages. Illus. Price, $3.00, cloth. Chicago: Year Book Publishers, 1941.

RHEUMATIC FEVER IN NEW HAVEN. John R. Paul, M.D. Professor of Preventive Medicine, Yale University School of Medicine. 176 pages. Illus. Price, $1.00, paper cover. Lancaster, Pa.: Science Press Printing Co., 1941.

DISEASES OF WOMEN. Ninth Edition. Harry Sturgeon Crossen, M.D., F.A.C.S. Professor Emeritus of Clinical Gynecology, Washington University School of Medicine; Gynecologist to Barnes Hospital, St. Louis Maternity Hospital, St. Luke's Hospital, etc.; and Robert James Crossen, A.B., M.D. Assistant Professor of Clinical Gynecology and Obstetrics, Washington University School of Medicine, etc., 948 pages. Illus. Price, $12.50, cloth. St. Louis: C. V. Mosby Co., 1941.

FUNCTIONAL PATHOLOGY. Leopold Lichtwitz, M.D. Chief of the Medical Division of the Montefiore Hospital; Clinical Professor of Medicine, Columbia University, New York. 567 pages. Illus. Price, $8.75, cloth. New York: Grune & Stratton, Inc., 1941.

THE DOCTORS MAYO. Helen Clapesattle. 812 pages. Illus. Price, $3.75, cloth. Minneapolis: University of Minnesota Press, 1941.

ENDOCRINE THERAPY IN GENERAL PRACTICE. 3rd edition. E. L. Sevringhaus, M.D., F.A.C.P., Professor of Medicine, University of Wisconsin. Chicago: Year Book Publishers, 1940.

The author has succeeded in presenting briefly and clearly the various endocrine disorders. He stresses their practical treatment on an endocrine basis. The fact that the endocrine problems of childhood and puberty are discussed adds to the value of the text.

The arrangement is systematic and the style makes the book easy to read. Numerous photographs of clinical cases serve to enhance its value. The treatment of glandular disturbances is simplified for the general practitioner by giving the names of the numerous commercial preparations.

RUSSELL J. MOE, M.D.

* * *

SULFANILAMIDE AND RELATED COMPOUNDS IN GENERAL PRACTICE. Wesley W. Spink, M.D., Associate Professor of Medicine, University of Minnesota. Chicago: The Year Book Publisher, 1941. 256 pages. Illus. $3.00.

The author, who is associate professor of medicine at the University of Minnesota, has written a volume in the series of General Practice Manuals put out by the Year Book Publishers.

The book is written in a concise manner and there is a very complete bibliography. The chapter on General Principles of Therapy takes up the chemistry of the sulfonamides and contains directions for the determination of concentration of the compounds in the

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body fluids and a table setting forth the conditions for which the different drugs are preferred; there is also a table of the diseases in which the sulfonamides are of no value.

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This is a practical and complete manual which is very timely and should prove valuable to the profession as a whole.

JAMES R. MANLEY, M.D.

SHOCK TREATMENT IN PSYCHIATRY: A Manual. Lucie Jessner, M.D., Ph.D., and V. Gerard Ryan, M.D. 149 pages. Price $3.50. New York: Grune & Stratton, 1941.

Shock therapy has opened a new era in psychiatry. Many questions still remain unanswered, and many changes will continue to be made, but shock treatment in some form or other is here to stay.

This book is a clear, concise and up-to-the minute manual on insulin, metrazol and electrical shock treatments. It also describes some of the more recent modifications of the pharmacological and electrical shock therapies. The section on each of these methods includes a short historical background, a detailed description of the techniques, a discussion of the changes which take place, and an impartial discussion of the merits of each. Comparatively less space has been given to the electrical shock methods since they were most recently developed and, therefore, they have been used less extensively and their comparative value has not yet been accurately evaluated. The authors of this book give a good description of the electrical-convulsive and the faradic shock therapies and they believe that these methods offer promise in the therapy of mental disorders.

This book should be of great value for the specialist who has not been able to follow the extensive current literature on this subject and for the practitioners who wish to acquaint themselves with those new therapeutic procedures which are now being employed by most psychiatrists.

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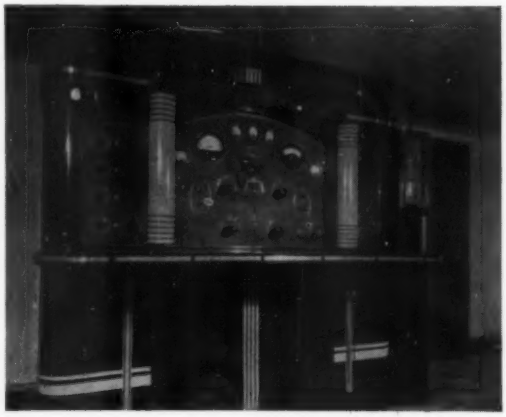

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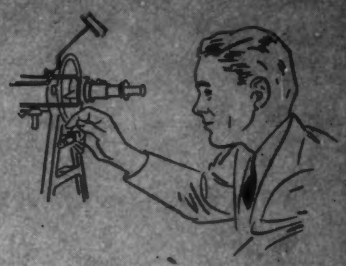

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***J.A.M.A., Vol. 93, No. 15, p. 1110, Oct. 12, 1929**
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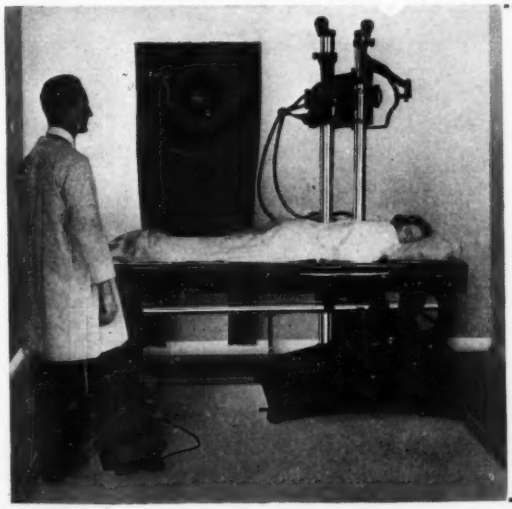

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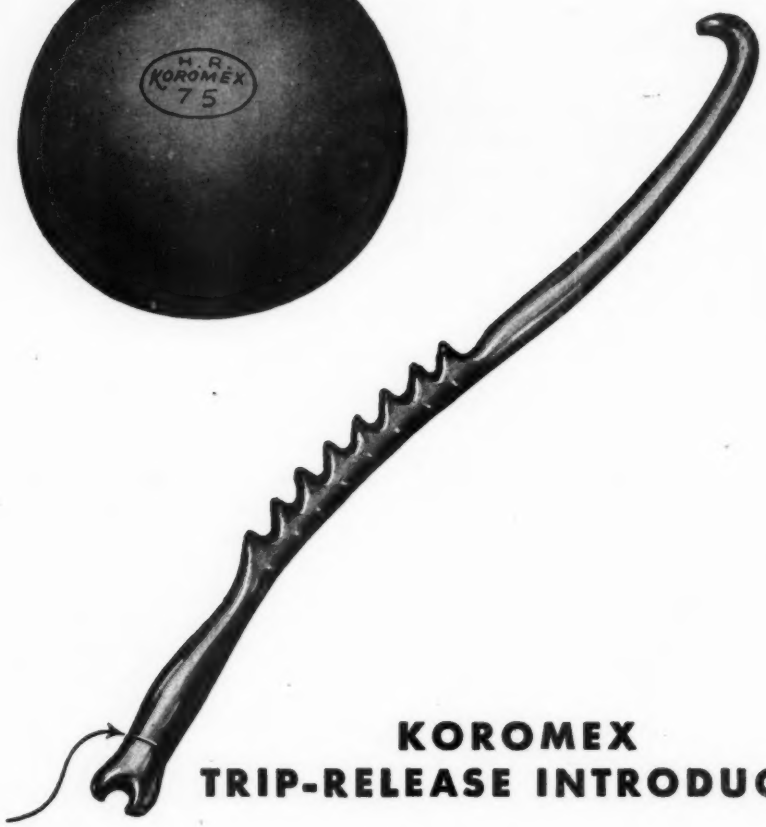

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1936. Mass. Agr. Expt. Sta. Bull. No. 338.

1937. Chemistry of Food and Nutrition, Fifth Edition, H. C. Sherman, MacMillan, N. Y.

1938. Nutrition Abstracts and Reviews 8, 281.

1939. Food and Life Yearbook of Agriculture, U. S. Dept. Agr., U. S. Government Printing Office, Washington, D. C.

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1 Elvehjem, C. A. — Nutritional Requirements of Man — Ind. & Eng. Chem., June 1941.

2 McCollum, E. V. — The Newer Knowledge of Nutrition — 5th Ed., 1939, p. 392.

3 McLester, J. S. — Nutrition and Diet in Health & Disease — 3rd Ed., 1939, p. 91.

4 McCollum, E. V. — The Newer Knowledge of Nutrition — 5th Ed., 1939, p. 320.

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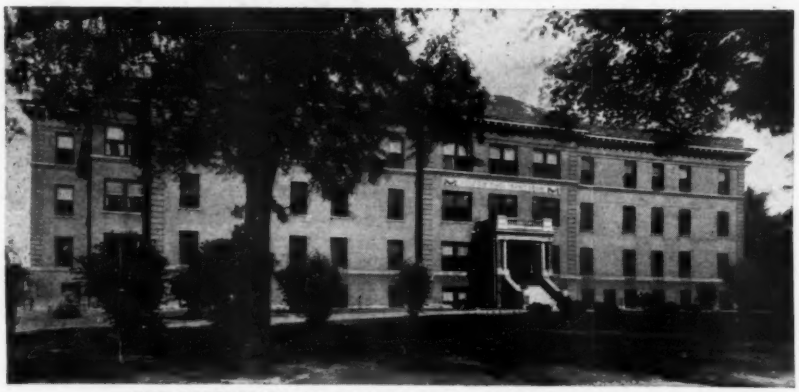

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